

THE TANYMECINI OF THE WEST INDIES
(COLEOPTERA: CURCULIONIDAE)¹

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ABSTRACT

The Tanymecini of the West Indies are discussed, with the exception of Polydacrys Schönherr and Pachnaeus Schönherr. The new genus Scalaventer is widespread and includes the following species: cyrillae, new species, from Jamaica; coccolobae, new species, from Jamaica; litoreus, new species, from Jamaica; montanus, new species, from Jamaica; remotus, new species, from Jamaica; subtropicus (Fall), new combination, from Cuba; caymani, new species, from Grand Cayman; jamaicensis, new species, from Jamaica; convexifrons, new species, from the Bahama Islands; gelinasus, new species, from Dominican Republic; valkyrius, new species, from Jamaica; and cubensis, new species, from Cuba. The new genus Paululusus is endemic to Hispaniola and contains three new species, calypso, hispaniolae, and constanzae. The new genus Paradacrys is endemic to the Bahama Islands and contains two new species, spatulatum and ensiformis. Pandeteius Schönherr is represented by testaceipes Hustache, endemic to the Lesser Antilles, and nodifer Champion established on Jamaica. The genus Isodrusus Sharp is represented by insulanus Howden from the Bahama Islands and guajavus, new species, from Jamaica. Lectotypes are designated for Pandeteius subtropicus Fall and Pandeteius nodifer Champion.

Biological information is given for many of the species from Jamaica. All teratological evidence is recorded, and the zoogeography of the tribe is briefly discussed.

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INTRODUCTION

The presence of ocular vibrissae is the traditional character for distinguishing Tanymecini from other tribes with a mandibular scar and without ocular lobes. The three new genera herein described, Scalaventer, Paululus, and Paradacrys, lack any trace of ocular vibrissae. The separated fore coxae alone remains to establish these genera as tanymecines and to distinguish them from other Brachyderinae with similar habitus.

It is note worthy that in the continental genera most closely related to these West Indian genera the condition of the vibrissae varies interspecifically. Of fifteen species of Isodacrys (some undescribed) the vibrissae are completely absent in seven species, variable or vestigial in five species, and well developed in three species. Of the three species of Isodrusus, the vibrissae are absent in one, vestigial in one, and well developed in one. Of five species of Pandeleiteinus, the vibrissae are vestigial in one and well developed in four.

It is also interesting to note the condition of the wings while comparing characters of higher taxa. The apterous condition is uniform and stable for Isodacrys, but does occur sporadically within at least two other well-known tanymecine genera where it has only specific rank or less. In the very large genus Pandeleiteius at least dentipes Pierce and simplarius Fall have fused elytra and only rudimentary wings. In the genus Tanymecus specimens of confertus Gyllenhal from one locality may have rudimentary or fully-developed wings (Champion 1911, pp. 178, 179). In the new genus Paululus, two species have well-developed wings, and one is apterous.

All species discussed in this paper (if not all Tanymecini) have the first two ventrites of the abdomen fused and the elytra with an interlocking mechanism consisting of a narrow flange on the right elytron which fits into an internal pocket on the left elytron.

METHODS

Color and color pattern are best observed at lowest power or without a microscope. Sculpture of the scales is described as it appears at 54x or more. Setae should be observed in profile as well as dorsally. Length of specimens is measured from the anterior edge of eyes to apex of the elytra in dorsal view. Width of the head between the eyes and the width of the beak must be carefully measured, preferably at high power. "Interantennal line" refers to a transverse "line" between or just caudad of insertion of the antennae on the dorsum of the beak; like the "median line" it may or may not be visibly modified.

The prothorax is measured for length dorsally along the median line, for width dorsally at the widest point, and for thickness laterally at the base. Measurement for relative length of pronotum and prosternum is made from lateral view.

Males may be externally distinguished from females by the morphology of ventrite 5. In males the apex of this ventrite is truncate or emarginate, deflected and never margined; in females the apex of ventrite 5 is rounded, never deflected and usually finely margined. When both sexes of a species are at hand for comparison, the males can be distinguished by their more narrowly separated fore coxae, narrower head and beak, narrower and straighter elytra, more convex eyes, and thicker fore femora.

Types in the Howden collection are stored in the Canadian National Collection.

SYSTEMATICS AND BIOLOGY

Key to West Indian Genera of Tanymecini

1. Corbels open. 2
 Corbels enclosed or semi-enclosed. 6
2. Tarsal claws connate. Bahama Islands, Jamaica
 Isodrusus Sharp (p. 50)
 Tarsal claws free 3
3. Ocular vibrissae well-developed. Anterior portion of ventrites 3, 4 and 5
 flat and unmodified. Lesser Antilles and Jamaica
 Pandeleteius Schönherr (p. 45)
 Ocular vibrissae absent. Anterior portion of ventrites 3, 4 and 5 glabrous
 and concave medially at least. 4
4. Anterior portion of ventrites 3, 4 and 5 with strong modifications extend-
 ing entire width of abdomen. Bahama Islands, Hispaniola, Jamaica,
 Cuba, southern Florida, Baja California.
 Scalaventer, new genus (p. 3)
 Anterior portion of ventrites 3, 4 and 5 modified with at most a narrow
 glabrous area (often medial only) and concavity (medial or entire width)
 which is always gentle, never carinate. 5
5. Fore coxae in both sexes separated by no less than four-fifths the width and
 usually more than the width of the antennal club. Eye well separated
 from dorsal surface. Aedeagus much thicker than antennal scape. Ba-
 hama Islands Paradacrys, new genus (p. 40)
 Fore coxae in both sexes separated at most by one-half the width of the
 antennal club. Eye very close to dorsal surface. Aedeagus scarcely
 thicker, if at all, than antennal scape. Hispaniola
 Paululusus, new genus (p. 32)
6. Corbels semi-enclosed. Apical emargination of beak keeled. Mandibular
 cusp situated at the apex of an anterior projection of the mandible.
 Greater Antilles, Guadeloupe. Polydacrys Schönherr
 Corbels enclosed. Apical emargination of beak not marked by a keel or
 carina. Mandible not produced. Greater Antilles.
 Pachnaeus Schönherr

Scalaventer, new genus

Size small to moderate, usually between 2.3 and 4.5 mm. in length. Body and legs covered with scales and small setae. Beak of various forms; inter-antennal line usually unmarked. Apex of beak emarginate, the carina marking the emargination obsolete to fine. Mandibles extending well beyond apex of beak. Ventral edge of scrobe usually visible from above. Scrobe of various shapes, usually reaching ventral surface or nearly so. Antennal scape without scales; funicle seven-segmented, the first segment nearly twice as long as the remaining segments which are equal to each other or nearly so; club moderate to large, often slightly pedunculate and not completely compact. Head in lateral

profile transversely swollen between or behind eyes, or not. Eye moderately small to large in size, large faceted, usually strongly convex and protruding. Pronotum produced anteriorly over head; anterior margin of prothorax unmodified, i. e., without ocular vibrissae, teeth or lobes. Elytra with humeral angles well developed. Stria 10 obsolete medially. Fore legs scarcely to conspicuously larger than other legs; fore femur swollen or not, without teeth or serrations on inner edge; fore tibia dentate on inner edge. Fore coxae usually separated by less than the width of the antennal club. Hind tibia with corbel open. Tarsal claws free. Abdomen with anterior portion of ventrites 3, 4 and 5 strongly modified across the entire width, i. e., glabrous, deeply, and abruptly concave, the concavity often delimited posteriorly by a strong carina. Aedeagus slender.

Type-Species. - Scalaventer cyrillae new species.

Scalaventer is masculine and refers to the transverse depressions and ridges of the ventrites which in many species are not unlike the rungs of a ladder. These gross modifications of ventrites 3, 4 and 5 are the principal diagnostic character for the genus.

Discussion. - Of the continental New World genera, Scalaventer is closest to Pandeleteinus and Isodrusus; of the West Indian genera, Scalaventer is close to both Paradacrys and Paululus as well as Isodrusus. In comparison with all these genera, except Isodrusus, the critical difference is the modification of the anterior portion of ventrites 3, 4 and 5 which in Scalaventer is abrupt, glabrous, and extends the entire width of the abdomen. The abdominal modifications of some Pandeleteinus approach those of Scalaventer; however, the abdominal modifications in these species become squamose toward the sides and flatten out, and actually resemble the condition of Paululus more than of Scalaventer. Pandeleteinus has the fore coxae much more narrowly separated and differs from the individual species of Scalaventer in two or more of the following additional characters: beak much broader with vertical sides; ocular vibrissae present; eyes much smaller; antenna shorter with much smaller antennal club; mandibles less protruding; and corbels and dorsal surface of tarsi squamose.

Isodrusus has the abdominal modifications similar to those of Scalaventer; the genus differs from Scalaventer principally in its connate tarsal claws. The West Indian Isodrusus may also be separated from Scalaventer by their proportionately larger eyes and smaller antennal club; the continental Isodrusus has ocular vibrissae.

Scalaventer is a much larger genus and much more widespread than the other two native West Indian genera. Its 12 species occur in the Bahama Islands, most of the Greater Antilles, southern Florida and Baja California; the three species of Paululus are known only from Hispaniola, and the two species of Paradacrys occur in the Bahama Islands.

Biological information on the adults of Scalaventer is discussed under each species; nothing is known of the immature stages. Figures 1 to 5 depict the feeding damage caused by adults of various species.

Scalaventer Species Groups

I. cyrillae group. Characterized by the most extreme development of the modification of ventrites, large and protruding eyes, narrowly separated fore coxae, large and loose antennal club. Jamaica. Two closely related species which have evolved to utilize two different genera of trees for adult feeding, Cyrilla and Coccoloba. (1) cyrillae new species, (2) coccolobae new species.

II. litoreus group. Characterized by the broad, flat beak and robust size and shape. Jamaica. Three closely related species with litoreus and montanus particularly having evolved to utilize different habitats, as suggested by their names. (3) litoreus new species, (4) montanus new species, (5) remotus new species.

III. subtropicus group. Characterized by widely separated fore coxae, scarcely enlarged fore legs, small eyes, small antennal club, beak with scales typical or near-typical to apex, flattened pronotum, relatively short and stout aedeagus. Cuba, Grand Cayman, Jamaica, southern Florida and Baja California. (6) subtropicus (Fall), (7) caymani new species, (8) jamaicensis new species. Closest to this group but with narrowly separated fore coxae and extremely long aedeagus; Bahama Islands. (9) convexifrons new species.

IV. gelinasus group. Characterized by short, thickened beak; ventrites with concavity arcuate, much wider medially than on sides. Unique females from Jamaica, Dominican Republic. (10) gelinasus new species, (11) valkyrius new species.

V. cubensis group. Characterized by relatively long, narrow beak; longer, slender legs; short aedeagus; compact antennal club. Cuba. (12) cubensis new species.

Key to the Species of Scalaventer

- 1. Apical emargination of beak occupying one-third of anterior width of beak. Head narrow between eyes; beak narrow, parallel-sided, same width as head between eyes. Aedeagus shorter than first three ventrites measured medially. Cuba. 12. cubensis, new species (p. 31)
- Apical emargination of beak occupying one-half or more of anterior width of beak. Beak not narrow and parallel-sided. 2
- 2. Ventrite 5 of female strongly, longitudinally convex its entire length and without depressions on either side. Beak very short and thickened; dorsal surface strongly constricted at base where (in female) it is only one-half as wide as head between eye (beak of male may be more slender). Apex of beak strongly deflected so that epistoma is nearly perpendicular to dorsal surface. High mountains of Dominican Republic.
- 10. gelinasus, new species (p. 27)
- Ventrite 5 of female flattened, or if slightly convex with a shallow depression or pit either side near base. Beak not as above 3
- 3. Beak broad and flat, continuous with frons, as wide as head between eyes, epistomal suture obsolete or weak. Robust in shape and size (3.0 to 4.6 mm.). Jamaica. 4
- Beak not as above, epistomal suture usually distinctly carinate. 6
- 4. Elytra with setae erect. Blue Mountains, 4000 to 5000 feet.
- 4. montanus, new species (p. 17)
- Elytra with setae decumbent. Coastal or lowlands forms 5
- 5. Intervals 4 to 6 at their apical termination slightly produced, the swelling conspicuous in dorsal outline. Eyes extremely flattened and large. Coastal. 3. litoreus, new species (p. 14)

- Intervals 4 to 6 not produced at their apical termination, not evident in dorsal view. Eyes moderately convex. Yallahs River Valley.
 5. remotus, new species (p. 19)
6. Elytral intervals equal, evenly setate. 7
 Elytral intervals 2, 4 and 6 less convex and/or without setae 8
7. Aedeagus as long as entire abdomen. Eye equidistant between dorsal and ventral surfaces. Rum Cay, Bahama Islands
 9. convexifrons, new species (p. 26)
 Aedeagus shorter than first three ventrites. Eye closer to dorsal surface than to ventral surface. Southern Jamaica.
 8. jamaicensis, new species (p. 24)
8. Fore coxae of both sexes separated by less than three-fourths the width of the antennal club. Aedeagus very slender, distinctly narrower than antennal club 9
 Fore coxae of females at least separated by approximately the width or more of the antennal club. Aedeagus (where known) as wide as antennal club 10
9. Aedeagus sinuate in profile. Male with fore femur only slightly thicker than hind femur. Female with glabrous anterior portion of ventrites 3, 4 and 5 grossly enlarged and modified so that the squamose surface of ventrite 3 is perpendicular to the plane of the abdomen (Fig. 44a). Jamaica, approximately 4000 feet and up
 1. cyrillae, new species (p. 7)
 Aedeagus evenly arcuate in profile. Male with fore femur grossly swollen, nearly twice as thick as hind femur. Female with anterior portion of ventrites 3, 4 and 5 not so grossly enlarged; the squamose portion of ventrite 3 oblique at most, continuous with the curve of ventrite 2 (Fig. 44b). Jamaica, lowlands to approximately 4500 feet
 2. coccolobae, new species (p. 10)
10. Scrobe acutely angled, the vertical portion slightly bowed towards apex of beak, deep and broad to the ventral surface of the beak. Female with anterior portion of ventrite 5 strongly arcuate medially. Blue Mountains, Jamaica. 11. valkyrius, new species (p. 29)
 Scrobe obtusely angled, not reaching the ventral surface 11
11. Elytral intervals 3, 5 and 7 elevated, especially towards declivity, the elevations interrupted before declivity to form separate swellings. Sutural interval slightly swollen (or not) on declivity well below disc of elytra. Cuba, Southern Florida, Baja California
 6. subtropicus (Fall), (p. 21)
 Elytral intervals 3, 5 and 7 scarcely more elevated than other intervals, nowhere interrupted. Sutural interval slightly swollen at summit of declivity. Grand Cayman.
 7. caymani, new species (p. 22)

1. Scalaventer cyrillae, new species

Figures 3, 6, 7, 16, 44a, 49, 60, 61.

Diagnosis. - Aedeagus sinuate. Female with glabrous anterior portion of ventrite 3 enlarged, oblique instead of perpendicular, directed caudally, leaving squamose portion reduced and vertical.

Description. - Holotype, male, length 2.7 mm., width 0.9 mm. Color brown, black and pale green, marked as follows. Head mottled brown and black; pronotum black on sides, broad median vitta predominantly pale brown. Each elytron with a conspicuous green spot on interval 5 just before middle, interval 4 black on basal fifth, remainder of elytron indistinctly marked. Legs slightly annulate. Scales mostly angular; margined; reticulate on head, pronotum and disc of elytra, becoming granular and amarginate on sides and apex of elytra; not contiguous; green scales of elytral spot imbricate, not margined, finely granular. Setae completely arched, scarcely elevated, about as long as a large scale; elytral intervals 2, 4 and 6 without setae except on declivity and extreme base.

In profile, beak and head nearly flat from apex to posterior edge of eye whence the contour is abruptly directed obliquely to pronotum, beak before eyes slightly longer than deep. Dorsum of beak at widest point slightly narrower than head between eyes; edges of beak over scrobe converging towards base, the sides here marked dorsally by a vague keel, the beak concave between these keels; median line marked only by a brief indentation between eyes; beak deflected apicad of interantennal line which is unmarked. Apical emargination of beak slightly obtusely angled, the sides slightly arcuate, finely but distinctly carinate, occupying approximately half the apical edge of beak, and with a row of three vibrissae on each side; epistoma finely rugulose. Scales apicad of interantennal line reduced in size, number and sculpture. Scrobe obtusely angled, dorsal edge of horizontal portion slightly sinuate, vertical portion separated from eye and apex of beak by one scale, ending at ventral surface beneath anterior edge of eye. Antennal club (Fig. 60) large, "loose", first segment cup-shaped. Eye moderate, strongly convex; viewed anteriorly, combined depth of eyes at most three-fourths as wide as distance between them.

Prothorax 1.05 times longer than wide, sides strongly rounded between conspicuous, broad basal and apical constrictions. Pronotum 1.6 times longer than prosternum; in profile, arcuate medially, the apical projection over head conspicuously higher than disc of pronotum. Punctures deep on sides of prothorax, becoming shallower medially.

Elytra 2.5 times longer than prothorax, elytra across humeri 1.2 times wider than prothorax. Base of elytra straight. Elytra with sides very slightly divergent from base to apical three-fifths, thence convergent, scarcely rounded, to apex; apical terminus of intervals 4 to 6 only obsoletely interrupting outline. In profile, elytra flat from base to about apical two-fifths, thence descending obliquely (more strongly after apical fifth) to apex; summit of declivity broadly rounded, poorly marked. Basal fifth of intervals 3 to 5 slightly, conjointly convex; interval 5 obsoletely elevated just beyond middle. Elytral striae set with fine punctures, slightly imperfectly aligned in vicinity of swellings.

Fore leg (Fig. 49) distinctly larger than hind leg; fore femur moderately, gradually swollen, 1.3 times as thick as hind femur; fore tibia with six small teeth on inner edge.

Fore coxae very narrowly separated, i. e., by less than the greatest width

of the scape, approximately three-sevenths the width of the antennal club. Modification of anterior portion of ventrites 3, 4 and 5 (Fig. 16) deep, perpendicular, straight, the edge not carinate. Ventrite 5 slightly convex, its apex broadly rounded and with a minute emargination.

Aedeagus (Fig. 61) in profile slightly sinuate for apical three-fifths, rather strongly deflected for basal two-fifths, thicker at base of apical opening, apex oblique; in dorsal view apex elongate-oval; slightly longer than first four ventrites.

Allotype, female, length 3.6 mm., width 1.4 mm. Differs from holotype in the following respects. Vividly marked (Fig. 7) as follows: vertex white with a basal black dot; pronotum with a broad, white median vitta; elytron without a green spot; basal seventh of interval 4 black; elytral disc with a black diamond on central half extending to stria 6 laterally, the diamond broadly bordered with white anteriorly and with mixed tan and white posteriorly; each elytron with two elongate black dots, one on interval 5 just in front of diamond and one on interval 5 at its apical terminus; legs annulate. Scales reticulate on head only; scales of pronotum strongly margined and coarsely granular; scales of elytra coarsely granular and finely margined on disc, becoming amarginate and more finely granular toward sides and apex. Beak with arcuate apical half nearly glabrous with only a few scattered, convex, shining scales; median line finely carinate in this glabrous area from concavity to apex of emargination; apical emargination approximately right-angled with sides slightly curved. Scrobe separated from apex of beak and eye by width of two scales. In profile, prothorax much thicker - 1.2 times longer dorsally than thick, the pronotum 1.4 times longer than the prosternum. Elytra 3.0 times longer than the prothorax; elytra across humeri 1.4 times wider than the prothorax. Base of elytra feebly arcuate. Elytra with sides divergent from base to just beyond middle, thence convergent, nearly straight, to the attenuate apex, the apical terminus of intervals 4 to 6 briefly interrupting outline. In profile (Fig. 6), the convex base of intervals 3 to 5 evident, disc subarcuate medially, summit of declivity broadly rounded, declivity feebly concave, attenuate. Suture and eleventh intervals swollen into a small knob at their apical terminus. Elytra flatter with swellings as in male. Elytral setae as in male except beginning at basal third on interval 6. Fore coxae separated by distance equal to greatest width of antennal scape, approximately five-sevenths the width of antennal club.

Ventrite 2 with its posterior-lateral angles enlarged, hooking over edge of elytra. Ventrite 3 (Fig. 44a) with glabrous anterior portion greatly enlarged, oblique instead of perpendicular, directed caudally, leaving squamose portion reduced and vertical instead of horizontal, the lateral edges of the glabrous keel narrowly hooking over edges of elytra. Glabrous anterior portion of ventrites 4 and 5 likewise oblique, but only a little higher than the plane of abdomen, the edge carinate; ventrite 4 with anterior and posterior edges slightly arcuate, converging medially, leaving squamose portion constricted medially; ventrite 5 elongate, approximately two-thirds as long as wide, apex narrowly rounded, slightly convex along median line, especially basally.

Type series. - Holotype, male, Hardwar Gap, Jamaica, 4000 feet, 25 August 1966, A. T. Howden, on Cyrilla racemiflora (Howden). Allotype, female, same data as holotype but 24 July 1966 (Howden). Paratypes, 367 males, 254 females. JAMAICA: 35 males, 22 females, same data as holotype (Howden); 155 males, 120 females, same data as holotype but 3-31 July 1966, A. T. Howden or [H. F.] Howden and Becker Collectors, some on Clethra occidentalis and Alchornea latifolia (CNC, Howden); 1 male, 3 females,

Hardwar Gap, Portland, 23 November 1958, 24 May 1963, 25 May 1964, 16 August 1964, T. H. Farr Collector (Inst. Jam.); 1 female, Hardwar Gap, 4800 feet, 13-15 July 1960, C. and P. Vaurie Collectors (AMNH); 1 male, 1 female, Green Hills [near Hardwar Gap], Portland Parish, 21 September 1945, E. L. Sleeper Collector (Sleeper); 1 male, Cinchona, 26 February 1911 (AMNH); 172 males, 105 females, Blue Mountain Peak, 7400 feet, 27-28 July 1966, Howden and Becker (CNC); 1 male, Main Range, Blue Mountains, 5-7388 feet, 17-19 August 1934, P. J. Darlington (MCZ); 1 male, 1 female, Newcastle, Mile 18 [from Kingston], St. Andrew, 25 July 1966, A. T. Howden, on Cyrilla racemiflora (Howden).

Discussion. - Males vary in length from 2.4 to 3.4 mm. and in width from 0.7 to 1.7 mm.; females vary in length from 2.9 to 4.2 mm. and in width from 1.1 to 1.7 mm. Color of males is usually similar to that of the holotype, but one-tenth of the specimens have additional green elytral spots on interval 5 at the apical third and on the sutural interval at the summit of the declivity; rarely the elytral spot is white, blue or absent. Many males have the ventral surface partly metallic golden green. Females are often vividly marked as in the allotype, but when the white band bordering the black diamond is broken it may be replaced by a spot of white (one-thirteenth of the specimens) or of green (rarely) in the same position as the elytral spot of the males. The holotype and allotype represent the extremes of variation in head and beak except that the median line is sometimes impressed from between the eyes to the concavity. On the disc of the elytra, white setae especially are sometimes less strongly arched making them much more conspicuous though they may actually be no longer. Setae sometimes are multiserial on interval 5 and the sutural interval at the summit of the declivity. The elytra of females particularly are variable; compared to the allotype they may be as flat or considerably more convex and the apex may be less attenuate. The number of teeth on the fore tibia varies from three to seven; they are never very large. The abdomen of the female is also subject to some variation. Blue Mountain Peak specimens do not have the "hooks" of ventrites 2 and 3 as well developed and the glabrous flange of ventrite 3 is never as enlarged as in the allotype. Hardwar Gap specimens more often have the "hooks" developed to the same extent as in the allotype. The glabrous anterior portion of ventrites 3 and 4 is always oblique and caudally directed and at its weakest is much more developed than in any other species of Scalaventer. Males often have the modification of ventrites 3, 4 and 5 arcuate instead of straight as in the holotype. The aedeagus is always strongly arcuate basally and with some sinuation in the apical portion.

S. cyrillae males are unique in the sinuate aedeagus and females are unique in the grossly modified, oblique anterior portion of ventrites 3, 4 and 5. The species may also be distinguished from its nearest relative, S. coccolobae, by its margined, never pustulate scales; gradual elytral declivity and attenuate apex; and less swollen fore femora. There is some overlap of the range of cyrillae and coccolobae, but the two species appear to be host specific, at least as adults; see Biology for further discussion.

It would seem possible that a specific barrier to mating between cyrillae and coccolobae is evident in their morphology. The elongate fifth ventrite of cyrillae females probably necessitates the aedeagus to be strongly arcuate at the base for successful mating; whereas the moderate length of the fifth ventrite of coccolobae females will accomodate the nearly straight and shorter aedeagus of coccolobae males.

Pandeleiteius ehippiatus Champion from Panama bears a striking superficial resemblance to S. cyrillae, the elytra being similarly attenuate and

marked with a white-bordered black diamond. However, ephippiatus is a true Pandeleteius with well-developed ocular vibrissae and unmodified anterior portion of ventrites 3, 4 and 5.

In this large series only two deformities were noted. In one the funicle has segments five and six enlarged. In the other, a female, the left half of the modification of ventrite 3 is abruptly male-like; the remainder of the abdomen appears typically female.

Biology. - S. cyrillae appears to be endemic to the cloud forests of the Blue Mountain Range of Jamaica with Cyrilla racemiflora L. its preferred adult food. In extensive tests in the summer of 1966, the weevils fed exclusively on Cyrilla leaves when offered Clethra occidentalis, Coccoloba spp., and Cyrilla, separately or in combination. Some specimens had been collected on Clethra but even these fed only on Cyrilla in captivity. Most of the tests lasted three weeks, the maximum length of time the specimens and leaves could be kept in the jars before they were completely covered with mold. Several attempts to gain information on the immature stages were unproductive.

On Blue Mountain Peak, S. cyrillae was reported by H. F. Howden and E. C. Becker to be one of the most common insects on the Peak during their overnight stay, 27-28 July 1966. The weevils were found on Cyrilla where it began to appear along the trail to Blue Mountain Peak and all the way to the top of the Peak (7402 feet) even though the Cyrilla dropped out at about 6000 feet. At the Peak the weevils occurred on Vaccinium meridionale, Clethra occidentalis and Clethra alexandri. As at Hardwar Gap, though, the weevils were absent in dense growths, common on vegetation exposed to the sun.

At Hardwar Gap, the Cyrilla trees were in bloom during July and August and the weevils were more numerous on blooming trees and new lateral shoots off the trunk. The weevils were observed feeding on the leaves (new growth preferred) with one long foreleg hooked over the edge of the leaf while they gradually ate away the margin; by the end of a month many leaves were reduced to half or less of their original size and some trees had a distinctly ragged appearance. Figure 3 shows the typical feeding damage to Cyrilla leaves. The weevils were as abundant on foliage during the day as at night.

The road from Kingston to Hardwar Gap offered a good opportunity to observe the junction of the ranges of S. cyrillae and S. coccolobae. Going up from Kingston Cyrilla first appears near Newcastle at the 18 mile post; only two S. cyrillae were taken here even though the trees were in bloom and rather numerous. Coccoloba spp. appear as far up as the 20 mile post and a short series of S. coccolobae was taken on these trees.

2. Scalaventer coccolobae, new species

Figures 1, 8, 13, 44b, 50, 59, 62.

Diagnosis. - Fore femur of male grossly swollen (nearly twice as thick as the hind femur). Beak slightly constricted at the interantennal line which is glabrous, grooved. Scales of elytral declivity pustulate.

Description. - Holotype, male, length 3.0 mm., width 1.0 mm. Color black, brown and nearly white, marked as follows. Head with a pale triangle extending from base to frons, sides of head black. Pronotum with a pale vitta occupying median half of disc, sides black. Elytra with intervals 1, 2 and 3 white from base to about apical third, the white area interrupted at apical third, irregularly bordered with black; an irregular black "V" on apical third from interval 5 to summit of declivity; intervals 7 and 8 entirely pale, remainder of

elytra mottled. Legs annulate. Scales mostly angular, not contiguous except some pale scales; scales of dorsum of beak, vertex and apex of pronotum margined, pustulate; scales of remainder of pronotum and disc of elytra finely or obsoletely margined, granular, not or obsoletely pustulate; most scales of declivity pustulate, on sutural interval becoming pustulate at about middle. Setae about as long as the longest scales; completely arched, scarcely elevated; setae absent on intervals 2 and 4 except on declivity, very sparse on interval 6.

In profile head and beak nearly flat from apex to about middle of eye, strongly convex to behind eye, thence oblique to pronotum. Dorsal surface of beak highly sculptured; sides rather abruptly flared outwards apicad of interantennal line where beak is slightly wider than head between eyes. Median line deeply impressed from interantennal line to middle of eyes, sides slightly deflected towards line. Interantennal line distinctly marked by a glabrous, shiny, slightly V-shaped groove; apicad of line scales sparse, circular, smooth and shiny; setae apicad of line straight, as long as two to four scales, directed towards sides and apex. Apical emargination ogival, occupying approximately three-fourths of apical edge of beak, finely carinate, a short carina extending from apex about half way to interantennal line, with a row of four vibrissae on each side. Scrobe slightly obtusely angled, dorsal edge of horizontal portion slightly sinuate; vertical portion distinctly closer to eye than to apex of beak, separated from eye by one scale and from apex of beak by width of about two scales; ending at ventral surface beneath anterior edge of eye. Antennal club (Fig. 59) large; pedunculate, i. e., first segment elongate basally. Eye large, very strongly convex and protruding; viewed anteriorly, combined depth of eyes approximately as great as the distance between them.

Prothorax 1.1 times longer than wide, sides moderately rounded between moderate basal and apical constrictions. Pronotum 1.6 times longer than prosternum; in profile, gently arcuate medially, the apical projection over head not higher than disc of pronotum. Punctures small, shallow, inconspicuous.

Elytra 2.3 times longer than prothorax, elytra across humeri 1.4 times wider than prothorax. Base of elytra straight. Elytra with sides parallel to apical two-thirds, thence convergent, scarcely rounded, to apex; apical terminus of intervals 4 to 6 obsoletely interrupting outline. In profile, elytra flat to apical two-thirds; summit of declivity broadly rounded; the declivity oblique, straight. Intervals 3 and 4 obsoletely, conjointly elevated on basal fifth; intervals 5 and 7 obsoletely elevated on apical half of disc; sutural interval slightly produced at summit of declivity. Striae set with small punctures.

Fore femur (Fig. 50) grossly swollen, 1.8 times thicker than hind femur; fore tibia with six small teeth and some serrulations on inner edge.

Fore coxae separated by less than the greatest width of the antennal scape; separated by approximately one-third the width of the antennal club. Modification of anterior portion of ventrites 3, 4 and 5 slightly wider medially, becoming nearly obsolete laterally on ventrite 3 and 4, the edge not carinate. Ventrite 5 nearly flat, broad, the apex narrowly truncate.

Aedeagus (Fig. 62) longer than first 3 ventrites; approximately one-fifth thicker than thickest part of scape; in profile, gently, almost evenly arcuate, the apex strongly oblique; in dorsal view, apex attenuate-elliptical; base of opening coriaceous along median line nearly to middle of aedeagus.

Allotype, female, length 3.5 mm., width 1.3 mm. Slightly teneral, hence color paler. Differs from holotype in the following respects. White markings of head and pronotum less distinct, somewhat mottled; head with a white spot between eyes embracing end of median groove; markings of elytra reduced to

the black spots, each of which is bordered posteriorly by a white spot. Beak in profile slightly concave; groove along median line reduced to an interocular pit and deep triangular pit at interantennal line. Scrobe with vertical portion narrower, equidistant between eye and apex of beak. Eye not as protruding, combined depth of eyes approximately three-fifths as great as distance between them. Prothorax 1.2 times longer than wide, sides straight between constrictions. Elytra 2.5 times longer than prothorax. Sides of elytra sub-parallel to apical third, thence convergent, slightly rounded to apex, the apex scarcely exceeding the summit of declivity viewed dorsally. Elytra in profile (Fig. 8) with convex base of intervals 3 and 4 evident, disc subarcuate, summit of declivity rounded, declivity slightly oblique. Fore femur less swollen, 1.3 times wider than hind femur; one tooth of fore tibia bifid. Fore coxae separated by approximately two-thirds the width of the antennal club. Modification of anterior portion of ventrites 3, 4 and 5 (Figs. 13, 44b) slightly oblique instead of perpendicular, rounded at the bottom, slightly arcuate in ventrites 3 and 4, median half elevated and subcarinate, squamose portion of ventrites 3 and 4 obsoletely concave. Ventrite 5 approximately one-half as long as wide, flattened and slightly turned up at apex, apex rounded.

Type series. - Holotype, male, Mandeville, Manchester Parish, Jamaica, 16 August 1966, A. T. Howden, on Coccoloba schwarzi (Howden). Allotype, female, same data as holotype (Howden). Paratypes, 141 males, 106 females. JAMAICA (listed by parishes from West to East): 55 males, 39 females, same data as holotype, A. T. Howden or [H. F.] Howden and Becker Collectors (CNC, Howden); 18 males, 15 females, Barbecue Bottom, Trelawny, 4, 10, 12 August 1966, A. T. or H. F. Howden, on Coccoloba troyana and Coccoloba longifolia (CNC, Howden); 1 male, 2 females, Good Hope, Trelawny, 11, 17 August 1966, A. T. Howden, on Coccoloba schwarzi (Howden); 5 males, 1 female, Hermitage, St. Elizabeth, 17 August 1966, E. C. Becker, on Coccoloba schwarzi (CNC); 1 female, Hermitage Res., St. Andrew, 21 September 1945, E. L. Sleeper (Sleeper); 5 males, 4 females, Irishtown, St. Andrew, 28 August 1966, A. T. Howden, on Coccoloba longifolia (Howden); 24 males, 20 females, Mahogany Vale, St. Andrew, 12, 20, 28 July 1966, A. T. Howden or [H. F.] Howden and Becker, on Coccoloba tenuifolia (CNC, Howden); 1 female, Mandeville, Manchester, 28 September 1945, E. L. Sleeper (Sleeper); 1 female, Mandeville, A. E. Wight (MCZ); 18 males, 17 females, Mizpah, Manchester, 5, 16 August 1966, A. T. or H. F. Howden, on Coccoloba schwarzi and Coccoloba longifolia (CNC, Howden); 6 males, 1 female, Newcastle, St. Andrew, 25 August 1966, on Coccoloba sp., A. T. Howden (Howden); 8 males, 3 females, Whitfield Hall, St. Thomas, 27 July 1966, A. T. Howden, on Coccoloba tenuifolia (Howden); 1 male, 1 female, Whitfield Hall, Blue Mountains, near 4500 feet, 13-20 August 1934, Darlington (MCZ).

Discussion. - Variation in the type series is as follows. Males vary in length from 2.4 to 3.4 mm. and in width from 0.8 to 1.3 mm.; females vary in length from 2.7 to 3.9 mm. and in width from 1.1 to 1.5 mm. Males usually have the disc of prothorax and elytra broadly white, broadly bordered with black on the prothorax; females usually have the disc of prothorax predominantly pale but bordered with mottled black, and the disc of the elytra rarely broadly pale. The number of pustulate scales is highly variable; the holotype represents nearly the maximum area covered by pustulate scales; rarely there are no distinctly pustulate scales even on the apex of the declivity. The interantennal line is always sharply defined by a groove and usually is conspicuously glabrous and shiny; occasionally, however, one or more scales may partially obliterate the groove. The sides of the apical emargination of

the beak are never straight; they may be arcuate or nearly parallel before converging to the apex. There are four or five vibrissae on each side of the apical emargination. In profile, the frons is sometimes much more abruptly transversely convex than in either the holotype or allotype. The eye varies in the distance it protrudes; in males it may be considerably less protruding than in the holotype but always more than in the allotype and in one extreme male the combined depth of the eyes is 1.3 times wider than the head between the eyes. The antennal club is rather variable, being sometimes much broader and often less pedunculate than in the holotype and allotype; however, none were seen that were as broad at the base as in cyrillae. In a few specimens the anterior projection of the pronotum is higher than the plane of the disc, similar to the condition of cyrillae. Elytra sometimes have interval 3 obsoletely elevated. In one striking male from Mahogany Vale, the setae on the disc of the elytra were "uncurled", i. e., semi-erect and incompletely arched. One-fifth of the paratypes from Mahogany Vale have some elytral setae partially uncurled, a much higher incidence than in the other localities. Many specimens have the numerous setae of the summit of the declivity less arcuate and conspicuous. The fore femora vary in the extent of their swelling; in males they are sometimes less swollen than in the holotype and in at least one male are swollen fully twice as wide as the hind femora. One particularly robust female from Barbecue Bottom has the fore femora 1.6 times the width of the hind femora. Fore tibial teeth vary from three to eight in number and are irregular in size and placement. Lateral edges of ventrites 2 and 3 were never observed to have hooks as in cyrillae, but a few females have an obsolete extension here. No appreciable variation was observed in the aedeagus.

Scalaventer coccolobae may always be separated from cyrillae by its gently arcuate aedeagus and relatively simple female abdominal modifications. Other differences are the lack of metallic green scales on ventrum and elytra, pustulate scales on the elytral declivity, larger eye, narrower base of antennal club, less attenuate apex of elytra, and frons more strongly and more anteriorly swollen. From other Scalaventer, coccolobae may be distinguished by its narrowly separated fore coxae, well-marked interantennal line, and grossly swollen fore femur.

The ranges of cyrillae and coccolobae overlap slightly, but there is no evidence of character displacement. S. cyrillae adults were never collected on Coccoloba and S. coccolobae was never collected on Cyrilla; in captivity neither species of Scalaventer would feed on the adult food of the other species.

Teratological manifestation includes two specimens with a deformed abdomen, one with a twisted body and one with a bifid antennal club.

Biology. - S. coccolobae is an endemic Jamaican species, widespread over the island where it is found at elevations ranging from 500 to 4500 feet. It has been collected on four species of Coccoloba only: longifolia Fisch., tenuifolia L., troyana Urban, and schwarzi Meisner.

The Mandeville series was collected in an open hillside pasture with scattered, apparently mature, C. schwarzi. Each tree seemed heavily infested and beating yielded numerous weevils (as well as a shower of ants). The Mizpah series was taken on a large tree in full bloom and most of the specimens seemed to come from the vicinity of the flower racemes. Most of the other specimens were taken on saplings growing along the roadside, sometimes in dense growths. Not all Coccoloba trees yielded Scalaventer and the reason for some being very productive while others in apparently similar situations were barren was never discovered.

Figure 1 shows the typical feeding damage of adult S. coccolobae on the

leaves of C. tenuifolia. Note that the weevils fed on the interior of the leaf as well as from the margin inwards. This appears to be a characteristic of the species of Scalaventer rather than an effect of a more tender host leaf. When Scalaventer cyrillae fed on their favorite young leaves it was always exclusively along the margin.

3. Scalaventer litoreus, new species

Figures 4, 5, 14, 38, 48, 63.

Diagnosis. - Beak flat. Eyes very large, strongly flattened. Punctures on sides of pronotum deep to foveate. Elytral setae strongly curved, their apices not quite touching surface.

Description. - Holotype, male, length 3.4 mm., width 1.3 mm. Color dark brown, tan and white, indistinctly marked. Head mottled, with a dark brown vitta behind eyes and a dark brown triangle on occiput; pronotum indistinctly marked with a pair of pale parentheses-shaped vittae on disc, sides dark brown; each elytron with a whitish spot on intervals 5 and 6 just before middle, apex pale beyond a "V" on apical third bordered anteriorly with dark brown; tibiae and to a lesser extent femora annulate with brown and white. Scales of irregular rounded or angular shapes, moderately to coarsely granular, margined on head and pronotum, weakly margined on elytra, not contiguous. Setae of head and pronotum nearly prostrate, as long as one to two scales; setae of elytra (Fig. 48) broader, evenly strongly arcuate, their apices not quite touching the surface, uniserial on intervals, directed apically except on sutural interval at summit of declivity where three setae are directed medially.

In profile, beak obsoletely arcuate to behind middle of eyes, thence gradually rounded to pronotum. Dorsum of beak as wide as head between eyes, rounded on edges, median line impressed for a short distance at base of frons. Interantennal line unmarked. Apical emargination approximately right-angled, finely but distinctly carinate, occupying approximately three-fifths of apical edge of beak, with a row of five vibrissae on each side; surface of epistoma finely rugulose. Beak slightly depressed behind apical emargination, glabrous for about the width of one scale; with only three or four rows of scales simplified before they become typical in size and sculpture. Scrobe (Fig. 38) very obtusely angled; horizontal portion brief, slightly arcuate; vertical portion oblique, separated from eye and apex of beak by two scales, ending at ventral surface beneath anterior edge of eye. Antennal club elongate, elliptical. Eye very large, subcircular, only slightly convex.

Prothorax as long as wide, sides gently rounded between narrow basal and apical constrictions. Pronotum 1.6 times longer than prosternum; pronotum in profile flattened, 1.2 times longer dorsally than thick, disc scarcely arcuate between constrictions. Punctures of prothorax foveate on sides, rapidly becoming obsolete on disc.

Elytra 2.5 times longer than prothorax, elytra across humeri 1.3 times wider than prothorax. Base of elytra obsoletely arcuate. Sides of elytra very slightly divergent to about middle, thence gently converging to apical sixth where the apical terminus of intervals 4 to 6 is prominent in the dorsal outline as an obliquely angled protuberance, the apex rounded beyond this. In profile elytra flattened from base to about middle, thence slightly descending to summit of declivity which is broadly rounded (Fig. 38). Elytral striae marked with large, deep punctures on basal half, the punctures becoming much

smaller beyond middle; elytral intervals slightly convex, about as wide as the distance between punctures in striae.

Fore femur rather strongly, abruptly swollen medially; fore tibia with four very small teeth on inner edge of one leg, three teeth on other leg.

Fore coxae separated by distance equal to about two-thirds the width of the antennal club. Anterior portion of ventrites 3, 4 and 5 abruptly, perpendicularly concave; the edge not carinate, on ventrite 5 slightly arcuate medially. Ventrite 5 convex, apex broadly rounded.

Aedeagus arcuate (Fig. 63); as long as first four and a half ventrites; apical opening elongate-elliptical, in profile more oblique than in montanus.

Allotype, female, length 4.6 mm., width 1.8 mm. Specimen slightly teneral, coloring less distinct than in male. Differs from holotype in the following respects. Sutural interval at summit of declivity with five conspicuous, white, medially directed setae; apical terminus of intervals 4 to 6 with two conspicuous, apically-directed setae. Head and beak much more robust than in type, dorsum of beak slightly narrower than head between eyes. Beak glabrous medially from apex of apical emargination to interantennal line, the glabrous area finely rugulose as are the epistoma and dorsum of mandible. Punctures of prothorax and elytra shallower than in holotype. Elytra in dorsal view with sides more rounded, apex a little more attenuate and apical terminus of intervals 4 to 6 more prominent. In profile elytra with declivity obsoletely concave, marked at its summit by a slight swelling. Inner edge of fore tibia with four teeth on one side, five on the other.

Anterior portion of ventrites 3, 4 and 5 (Fig. 14) abruptly, perpendicularly concave, the edge subcarinate on ventrites 4 and 5, central three-fifths rather strongly arcuate, and on ventrites 4 and 5 elevated medially as well. Ventrite 5 nearly flat, its apex narrowly rounded.

Type series. - Holotype, male, Duncans, Trelawny, Jamaica, 19 August 1966, A. T. Howden, on Krugiodendron ferreum (Howden). Allotype, female, same data as holotype (Howden). Paratypes, 143 males, 117 females. JAMAICA: 79 males, 53 females, same data as holotype except 28 on Krugiodendron ferreum, 47 on Haematoxylum campechianum, A. T. Howden or [H. F.] Howden and Becker Collectors (CNC, Howden); 59 males, 57 females, same locality as holotype, 8-23 August 1966, A. T. Howden or [H. F.] Howden and Becker, 2 at black light, 54 on Krugiodendron ferreum, 73 on Haematoxylum campechianum, 3 on Ehretia tinifolia (CNC, Howden); 5 males, 5 females, Reading, St. James, 18 August 1966, A. T. Howden, on Haematoxylum campechianum (Howden); 2 females, Alligator Pond Bay, 20 February 1937, Chapin and Blackwelder, Sta. 410 (USNM).

Discussion. - Males vary in length from 3.0 to 4.1 mm. and in width from 1.2 to 1.6 mm.; females from the north coast (Duncans, Reading) vary in length from 3.4 to 4.6 mm. and in width from 1.4 to 2.0 mm. The two paratypes from the south coast (Alligator Pond Bay) are particularly robust females 5.4 to 5.5 mm. in length and 2.2 to 2.3 mm. in width, fully one-sixth larger than any north coast females. These two specimens also differ from the north coast specimens in having the scrobe scarcely angled, the elytral setae more numerous, and the sutural interval much more produced at the summit of the declivity, in the latter aspect approaching the condition of remotus. Variation in color pattern is considerable, the brown and white bands on the femora and tibiae being the most constant. The thorax is seldom as well marked as in the holotype and allotype. The elytral spot on intervals 5 and 6 is often completely absent, is not associated with sex, and in a very few specimens is greenish. Maximum color pattern is found in females which have the elytral white "V"

particularly sharp and broad, often covering the entire declivity but with the apical terminus of intervals 4 to 6 darker. Some features of the beak are subject to considerable variation. The apical emargination is usually approximately right-angled, but may be acutely or obtusely angled; the sides of the apical emargination may be straight or curved and they may be a little more strongly carinate than in the holotype. The holotype and allotype represent the two extremes of the condition of the scales on the apex of the beak. The presence of the interocular pit is quite constant, though it is generally deeper in males than in females and in males is usually deeper than in the holotype; it may be reduced to a finely impressed line. The scrobe varies in length from complete to the ventral surface to ending well above it, depending partly on the robustness of the beak.

The elytral declivity of males is often feebly sinuate and sometimes has the summit feebly indicated. Compared to the allotype, the elytra of females may have the declivity more or less concave, the sutural interval much more produced at the summit of the declivity, and the apex a little more attenuated. The females often have the modification of the anterior portion of the ventrites less arcuate than in the allotype, but the modification of ventrite 5 at least is always finely carinate and slightly elevated medially. Ventrite 5 of females is usually more convex along the median line than in the allotype.

S. litoreus is very closely related to montanus (see discussion of montanus), the strongly curved elytral setae of litoreus being the most reliable physical character for separating the two species. If specimens of both species are available for comparison, it is obvious that litoreus also has a more strongly carinate epistoma, paler color, more shallowly punctured pronotum, and more obtusely-angled scrobe. On the average, litoreus also has a flatter eye and more abrupt declivity, but there is overlap on these characters. S. litoreus is known only from small areas on the north and south coasts of Jamaica, whereas montanus occurs in the Blue Mountains between about 4000 and 5000 feet.

From other species of Scalaventer, litoreus may be separated by its very flat beak; large, flat eyes; terminus of intervals 4 to 6 prominent in dorsal view.

Teratological manifestations include two deformed abdomens, one deformed beak, and a bifid tibia with one normal tarsus and one bifid tarsus.

Biology. - At Duncans, where the majority of the type series was collected, the first few specimens were taken in the morning on Krugiodendron ferreum (Vahl) Urban, Ehretia tinifolia L., and Haemotoxylum campechianum L. (logwood). Here the three species of trees were scattered in a fence row and in a hilly cow pasture overgrown with Opuntia. The beetles were never found in numbers on these trees during the day. At night the Krugiodendron and Ehretia still yielded only sparse numbers of beetles, but several large logwood trees on an exposed slope were found to be heavily infested. The beetles were very active at night and when a large number were beaten onto a collecting sheet some would always escape the collector by flying off. This is quite in contrast to other Scalaventer (except montanus) which, like Pandeleteius, land "spread eagle" on the sheet and remain motionless for a long time.

S. litoreus was taken at only one other place on the north coast - on logwood growing in an undeveloped residential lot at Reading, St. James. Logwood was beaten extensively elsewhere and yielded no Scalaventer.

In feeding experiments, specimens were kept segregated according to the tree on which they had been collected; each jar was provided with leaves of all three species of tree. All specimens fed on Krugiodendron ferreum extensively and to a much lesser extent on logwood. There was no evidence of feeding on

Ehretia tinifolia after a week. The typical feeding damage of S. litoreus on leaves of Krugiodendron is shown in Fig. 4 and on leaves of logwood in Fig. 5. Note that Krugiodendron leaves especially were eaten from the margin inwards in contrast to the feeding of other species except S. coccolobae. These Krugiodendron leaves were relatively thin and tender, and the Coccoloba leaves nearly as tender.

A possible explanation for the distribution of S. litoreus may be found in the adult food. Krugiodendron, native to Jamaica, occurs in dry limestone woodland; it is not known from east of Clarendon or St. Ann Parishes or from the extreme western part of the island. Logwood occurs commonly in dry thickets at low elevations all over Jamaica, but it is not native.

4. Scalaventer montanus, new species

Figures 2, 10, 17, 65.

Diagnosis. - Elytral setae erect. Thoracic punctures large or foveate on sides.

Description. - Holotype, male, length 3.5 mm., width 1.3 mm. Specimen slightly teneral as evidenced by the testaceous color of the aedeagus and the submetallic lustre of the dorsal scales; abdomen slightly dislocated. Color dark and light brown, indistinctly marked. Head with a dark basal triangle; pronotum with an imperfect elongate, dark, median diamond enclosed by pale "parentheses"; elytra with a vague, pale "V" on apical third, and an irregular cluster of pale green scales on intervals 5 and 6 before middle; tibiae with a narrow pale band around the middle. Scales of irregular angular shapes, coarsely granular, mostly margined, not contiguous. Setae of head and pronotum inconspicuous, nearly prostrate, slender, as long as two to three scales. Setae of disc of elytra slightly longer, lanceolate, erect for approximately basal two-thirds with the apical third deflected; uniserial with some irregularities; directed apically except on sutural interval at summit of declivity where four are directed medially.

In profile, beak obsoletely arcuate to middle of eyes, thence arcuate to pronotum. Dorsum of beak very slightly narrower than head between eyes, the edges broadly rounded from eyes to antennal insertions. Median line finely impressed from interantennal line to beyond middle of eyes, ending in a narrow pit. Interantennal line unmarked. Beak apicad of interantennal line remarkably flat; scales abruptly very small and sparse; apical emargination not well defined, obtusely angled, occupying approximately three-fifths of apical edge of beak, with a row of four slender vibrissae on each side; surface of epistoma finely rugulose. Scrobe obtusely angled with horizontal portion very short, arcuate; widened at angle; vertical portion oblique, deep throughout, ending at ventral surface beneath anterior edge of eye, at closest points separated from apex and eye by about width of two scales. Antennal club elongate, elliptical. Eye large, nearly circular, moderately convex.

Prothorax as long as wide, sides gently rounded between narrow basal and apical constrictions. Pronotum 1.7 times longer than prosternum; pronotum in profile flattened, disc slightly arcuate between constrictions, 1.3 times longer dorsally than thick. Punctures of prothorax foveate on sides, becoming shallower medially.

Elytra 2.6 times longer than prothorax, elytra across humeri 1.2 times wider than prothorax. Base of elytra slightly arcuately emarginate, sides of elytra very slightly divergent from base to about middle, thence gently converg-

ing to apex, the apical terminus of intervals 4 to 6 prominent in dorsal outline as an obliquely angled protuberance. In lateral view (Fig. 10), elytra obsoletely arcuate from base to about middle, thence gradually descending to apex, the summit of declivity scarcely perceptible. Elytral striae 1 to 9 marked with large, deep punctures, the punctures becoming smaller beyond middle; elytral intervals slightly convex, basally about as wide as space between punctures in striae.

Fore femur rather strongly, abruptly swollen medially; fore tibia with five small, equidistant teeth on its inner edge, serrulate apicad of last tooth.

Fore coxae separated by distance equal to three-sevenths the width of the antennal club. Anterior portion of ventrites 3, 4 and 5 abruptly, perpendicularly concave, the edge not carinate, slightly arcuate medially. Ventrite 5 convex, apex rounded.

Aedeagus (Fig. 65) arcuate, as long as first four and one-third ventrites; apical opening elliptical.

Allotype, female, length 4.6 mm., width 1.8 mm. Differs from holotype in the following respects. Vividly marked as follows: pronotum mostly pale, the black median diamond reduced to a few fine black lines; elytra with a conspicuous white vitta extending along interval 7 for basal third, along intervals 6 and 7 for median third, thence obliquely to suture at summit of declivity, the disc of elytra broadly black in front of the white, remainder of disc mottled brown; tibiae with central band conspicuous, an apical band less so; the cluster of green scales on intervals 5 and 6 greatly reduced, inconspicuous. Setae of elytra the same color as the scales beneath them. Head much more robust, eyes flatter. Pronotum with punctures shallower. Proportions of pronotum and elytra as in holotype. Elytra with striae punctures much smaller than in holotype, moderate, becoming small apically. Sutural interval moderately produced at summit of declivity; intervals 3 and 5 convex at summit of declivity only, apical terminus of intervals 4 to 6 slightly more produced than in holotype, all these swellings with a few extra setae. Fore tibia with only three equidistant teeth on inner edge. Anterior portion of ventrites 3, 4 and 5 (Fig. 17) with the modification more distinctly arcuate medially, the edge subcarinate in ventrite 4, carinate in ventrite 5. Ventrite 5 scarcely more elongate than in holotype, obsoletely convex medially.

Type series. - Holotype, male, Whitfield Hall, St. Thomas, Jamaica, 27 July 1966, A. T. Howden, on *Clethra occidentalis*, Feed. Exp. [= used in feeding experiments] (Howden). Allotype, female, same data as holotype (Howden). Paratypes, 13 males, 5 females. JAMAICA: 8 males, 4 females, same data as holotype (Howden); 1 female, Whitfield Hall, Blue Mountains, near 4500 feet, 13-20 August 1934, Darlington (MCZ); 1 male, Hardwar Gap, 4000 feet, 9 July 1966, [H. F.] Howden and Becker (CNC); 3 males, Hardwar Gap, 4000 feet, 10, 15 July 1966, A. T. Howden, one specimen collected at light (Howden); 1 male, Cinchona to Newhaven Gap, St. Andrew, 27 August 1949, Robert Hart (Sleeper).

Discussion. - Males vary in length from 3.3 to 3.8 mm. and in width from 1.3 to 1.4 mm.; females vary in length from 4.0 to 4.5 mm. and in width from 1.6 to 1.8 mm. The green elytral spot is not as uniquely masculine as it is in *cyrillae*; of the *montanus* paratypes, five males have no green spot and two females do have some green. The holotype represents the usual coloring of males; one male has the white elytral line developed almost as much as in the allotype. The allotype is by far the most vividly marked specimen. The setae may be all pale or the same color as the scales beneath. The interocular pit on the median line is absent in one male and is often greatly reduced or absent in females. The poorly defined epistoma is remarkable; it is less distinct than

in Hadromeropsis, but more so than in Tanymecus. The teeth of the fore tibiae vary in number from three to five, often on different sides of the same beetle. The fore coxae are much closer in most males than in the holotype. The aedeagus varies from moderately to strongly arcuate in profile; the figure represents the median.

S. montanus is very close to litoreus, the erect elytral setae of montanus being the only tangible character by which one can reliably separate the two species. However, the species appear to occupy two distinctly different habitats: cool mountain cloud forest vs. hot sea-coast; montanus is known only from about 4000 to 5000 feet in the Blue Mountains where Clethra occidentalis is the preferred adult food, and litoreus is known only from sea level where Krugiodendron ferreum and Haematoxylum campechianum are the preferred adult foods. In comparison with litoreus, montanus tends to have a less distinct epistoma, darker color (quite in keeping with its geographical habitat), more deeply punctured pronotum, and more angled scrobe. The erect elytral setae will also distinguish montanus from all other Scalaventer.

At Hardwar Gap, montanus occurs sympatrically with cyrillae, and at Whitfield Hall montanus occurs with coccolobae. These species belong to the species group characterized by a slender, highly sculptured beak, grossly protruding eyes, and highly modified female ventrites.

Biology. - Clethra occidentalis appears to be the usual food of montanus adults, although specimens kept in jars for two weeks with both Clethra and Coccoloba leaves, fed on the Coccoloba leaves as well. They were not tested for Cyrilla feeding. At Whitfield Hall, montanus was collected only on Clethra and S. coccolobae was the only species collected on Coccoloba. At Hardwar Gap where both Clethra and Cyrilla occur but not Coccoloba, three specimens of montanus were collected, one at night at black light and two without host data. A few specimens of S. cyrillae were taken on Clethra but in extended feeding experiments they did not feed on Clethra whether given a choice of leaves or not.

Figure 2 illustrates the typical feeding damage of montanus to Clethra leaves: margins excised continuously with little feeding inwards and no feeding on stems or petioles.

The population of montanus is certainly much larger at Whitfield Hall, where an overnight trip yielded 14 specimens, than at Hardwar Gap where several weeks of intensive collecting yielded only three specimens. This coincides with the abundance of Clethra. The season of adult emergence is indicated by the fact that teneral specimens were collected at both ends of the period 9 July to 27 August. The Howden series from Whitfield Hall was taken along the first mile of the trail leading to Blue Mountain Peak where Clethra trees of good size were just coming into bloom. The specimens were all beaten from the foliage of the trees and none were observed prior to beating.

5. Scalaventer remotus, new species

Figures 20, 39, 43, 47.

Diagnosis (based on female). - Elytra with sutural interval at summit of declivity greatly elongated into a conical protuberance. Carina of anterior portion of ventrite 5 abruptly produced into a point medially. Pronotum with punctures small to obsolete. Elytral setae scarcely arched, their apices touching surface.

Description. - Holotype, female, length 3.4 mm., width 1.4 mm. Color

rust, gray-white and dark brown-black. Head obscure rusty with dark vitta behind eye, side of head and beak whitish; pronotum predominantly gray-white with an irregular dark vitta at extreme lateral-dorsal edge. Elytra elaborately patterned as follows: disc rust except sutural and second intervals gray, becoming darker posteriorly; humerus and interval 4 on basal eighth dark; a dark, sinuate fascia across basal third from suture to interval 7 partly enclosing a white spot on intervals 5 and 6; a dark lunule on apical third from suture to stria 7; a broad, conspicuous white lunule just behind dark lunule, this white lunule becoming tan posteriorly and with a short dark vitta on intervals 3, 5 and 7 on or before declivity; sides of elytra medium gray. Femora obsoletely banded; ventral surface subopalescent gray-white. Scales of irregular angular shapes; scales of head and pronotum mostly contiguous; granular to subreticulate, not margined or very weakly so; scales of elytra mostly not quite contiguous, not margined but some scales with a thickening of the granules around the edge. Setae of head and prothorax as long as the longer scales, nearly prostrate, moderately thick, dark on head and apex of pronotum, white on remainder of prothorax. Setae of elytra (Fig. 47) like those of head and pronotum but slightly more arched, their apices still touching surface; setae same color as the scales beneath them, uniserial on all intervals but more numerous on alternate intervals and on sutural protuberance.

Beak (Fig. 43) short, thick, cubical; in profile (Fig. 39), beak flat, in a continuous plane with frons, head gently arcuate from posterior edge of eyes. Dorsum of beak as wide as head between eyes, feebly excavate between insertion of antennae. Interantennal line unmarked. Median line impressed for a short distance between eyes; beak with a vague, shallow depression at base, the depression splitting and continuing briefly around apical emargination; apical emargination ogival, occupying one-half the apical width of the beak, weakly carinate posteriorly, a weak glabrous keel continuing from apex to depression at base of beak. Scales apicad of interantennal line small, convex, slightly granular; setae apicad of interantennal line rapidly becoming longer, more erect, and more numerous apically, with a row of eight to eleven vibrissae on each side of apical emargination. Scrobe obtusely angled, deep throughout its length; dorsal edge of horizontal portion sinuate, wider at angle; vertical portion with its posterior edge slightly curved, at the narrowest point equidistant between apex and eye from which it is separated by only one scale, ending at ventral surface beneath about middle of eye. Antenna with first segment of funicle elongate-oval; second segment half the size of the first; segments three to seven shorter, equal in length, cubical, becoming broader than long; antennal club moderate with all four segments discrete. Eye moderate, elongate.

Prothorax as wide as long, wider apically than basally, sides moderately rounded between broad apical and basal constrictions, the constrictions nearly confluent on disc medially. Pronotum 1.7 times longer than prosternum; pronotum sinuate in profile, 1.2 times longer dorsally than thick. Prothorax with punctures small to obsolete on disc and sides, except in the dark lateral vitta where they are small to moderate.

Elytra 2.7 times longer than prothorax, elytra across humeri 1.4 times wider than prothorax. Base of elytra slightly arcuately emarginate. Elytra in dorsal view with sides slightly divergent from just behind humeri to about middle, thence gently rounded to apex, slightly constricted beneath apical terminus of intervals 4 to 6. Elytra in profile (Fig. 39) with basal sixth somewhat prominent, thence slightly arcuate to short, conical protuberance on sutural interval at summit of declivity, dorsal surface of protuberance

nearly continuous with the curve of the elytra, protuberance set about one-third below disc of elytra; the declivity nearly perpendicular, slightly concave, its apex slightly exceeding the end of the protuberances. Elytral striae set with small, perfectly aligned punctures; elytral intervals slightly convex, apical terminus of intervals 4 to 6 not produced.

Fore femur gradually, moderately swollen medially; fore tibia scarcely expanded apically, with four small, equidistant teeth on inner edge.

Fore coxae separated by a distance equal to width of antennal club. Anterior portion of ventrites 3, 4 and 5 (Fig. 20) abruptly concave, the modification slightly arcuate; ventrite 4 with a median tubercle, ventrite 5 with median tubercle expanded into an abrupt median point from which a short keel extends caudally. Ventrite 5 flat except for median point, elongate.

Type series. - Holotype, female, Mahogany Vale, St. Andrew, Jamaica, 20 July 1966, A. T. Howden, on Coccoloba tenuifolia (Howden). No paratypes.

Discussion. - It is unfortunate that the two prime diagnostic characters of this species are almost uniquely female. Undoubtedly males will have no such projected point on ventrite 5, and the conical protuberance of the sutural interval will be considerably reduced. Unfortunately, the distinctive color and pattern of the female may also be completely different in the male, judging from congeners. The male, of course, may well have a distinctive aedeagus, if not other characters of its own. In any event, the scrobe is seldom subject to sexual modification and it, combined with the characters of the beak should separate either sex of remotus from other Scalaventer species.

From other Scalaventer in the species group (montanus, litoreus) with a broad, flat beak, remotus may be separated by its more numerous vibrissae bordering the apical emargination, obsolete punctures of pronotum, nearly prostrate elytral setae, and unmodified apical terminus of intervals 4 to 6.

Biology. - The holotype was collected about midday on one of three trips to Mahogany Vale during July, 1966. The locality is in the interior Yallahs River Valley at a relatively broad flood plain with a scrub growth at the edge of the plain containing sapling Coccoloba tenuifolia L. Numerous specimens of S. coccolobae were taken at the same time and it is possible that night beating would have produced more specimens of both species. It was extremely hot during the day.

6. Scalaventer subtropicus (Fall), new combination

Pandeletejus [sic] subtropicus Fall, 1907, p. 263; Howden, 1959, p. 387-9.

Lectotype, here designated, male, labelled, "Key Largo, Fla." [hand printed], "subtropicus [hand printed] Type [mechanically printed on white paper]", "MCZ Type 25140" [on red paper] (MCZ).

Diagnosis. - Elytral intervals 3, 5 and 7 elevated, especially towards the declivity, the elevations interrupted before declivity to form separate swellings. Suture interval slightly swollen (or not at all) on declivity well below disc of elytra.

Description. - Since this species was recently discussed in detail (Howden, 1959), only a few pertinent details of comparative value are recorded here. Length 2.9 to 4.0 mm. Beak fully squamose with typical or nearly typical scales to apex; apical emargination with an average of two vibrissae on each side. Beak with median line impressed from interantennal line to middle of eyes or beyond; interantennal line marked with a faint, fully squamose ridge;

median line marked or not with a faint glabrous carina from apex of epistoma to interantennal line.

Sides of elytra in both sexes gently divergent to about middle thence gradually converging to apex, the apical terminus of intervals 5 to 7 swollen and interrupting dorsal outline. All elytral swellings more prominent in females than in males. Declivity gradual, not marked at its summit. Elytra with striae punctures slightly irregularly aligned on disc.

Females with anterior portion of ventrites 3, 4 and 5 with concavity perpendicular, sharp-edged but not carinate, nearly straight; ventrite 5 nearly flat with a distinct shallow pit at base either side of midline. Males with concavity perpendicular but edge slightly more rounded.

Aedeagus slightly longer than first three ventrites measured medially; straight for apical three-fifths, thence gently curved to base, approximately as wide as the antennal club excluding hairs.

Type material. - Paralectotypes, hereby designated, 3 females, labelled "Key Largo, Fla.", "Beyer", "A. Fenyes Collection", and a label on one pin in Fall's hand "subtropicus Fall. Cotypes" (CAS).

There has never been a lectotype designated in spite of the "type" label on the MCZ specimen. At the time of the Pandeleiteius revision (Howden, 1959, p. 388) a lectotype was unnecessary for nomenclatorial stability, but with the description of a closely-related species, S. caymani, it is now essential.

The lectotype is missing the right fore femur and tarsus and the left hind tarsus and appears to be slightly teneral. It is 3.2 mm. long and 1.3 mm. wide.

Distribution. - Cuba, southern Florida, Baja California. Total number of specimens examined: 11. West Indian records: CUBA. 1 female, San Vincente de Vinales, July, Archer (MCZ).

Discussion. - The specimen from Cuba is a female with the elytral swellings much more pronounced than in more northern specimens.

The interrupted elytral swellings, slightly irregular striae, and form of the aedeagus should distinguish this species from all other West Indian tanymericines. Even though males may have the elytral swellings greatly reduced, the striae are disproportionately irregular in the vicinity of the swellings, making the combination of these two characters useful for either sex.

In 1959 (pp. 388-389), I stated that subtropicus was incongruous with Pandeleiteius, but I did not recognize then that the more significant character was in the modified ventrites rather than the short, slender aedeagus. In Pandeleiteius the anterior portion of ventrites 3, 4 and 5 is flat and unmodified.

7. Scalaventer caymani, new species

Figures 15, 40.

Diagnosis (based on females). - Elytral intervals 3, 5 and 7 slightly elevated on disc, becoming flat before declivity. Sutural interval moderately swollen at summit of declivity which is rather abrupt. Elytra parallel-sided.

Description. - Holotype, female, length 3.7 mm., width 1.4 mm.; probably somewhat teneral. Color pale cupreous and opalescent white with some dark brown. Head mottled cupreous and white; pronotum cupreous with a broad white vitta either side of median line; disc of elytra somewhat mottled, with a broad dark brown fascia between about middle and apical third narrowly bordered posteriorly by white. Ventrums and sides of beetle white. Swelling on sutural interval at summit of declivity white, accenting it. Scales of irregular shapes, contiguous (especially white scales) or not, strongly margined (except white

scales), coarsely to finely granular, scales of head more strongly sculptured. Setae of head and pronotum inconspicuous, mostly decumbent; setae of elytra more conspicuous, longer than the average scale, completely or incompletely arched, mostly uniserial on elytral intervals but more numerous on alternate intervals and sometimes multiserial where these intervals are most elevated.

In profile (Fig. 40), beak rather thick, its dorsum feebly arcuate; head subspherical, very slightly more prominent between eyes. Head viewed anteriorly very robust, eyes scarcely exceeding it. Beak short, dorsal surface one-tenth narrower than head between eyes, sides slightly divergent over scrobes. Median line marked by a finely impressed line from about middle of eyes to interantennal line and from thence obsolete carinate. Interantennal line glabrous for about half its length. Scales apicad of interantennal line becoming sparser, smaller, smooth and convex; setae apicad of interantennal line erect, becoming longer. Apical emargination of beak moderately shallow, arcuate with its apex obtusely angled, occupying approximately one-half the width of the beak apically; marked by an obsolete carina and with a row of seven vibrissae on each side. Scrobe slightly obtusely angled, much wider at angle, the vertical portion separated from apex by one scale and from eye by four scales, slightly curved posteriorly, rapidly tapering and ending before ventral surface below anterior edge of eye. Antenna with first segment of funicle elongate, slender; segments 2 to 7 subequal, slender, about one-half the length of first segment; antennal club moderate. Eye moderate, larger than in *subtropicus*.

Prothorax broad, as wide as long, flattened, distinctly wider apically than basally, sides feebly rounded between weak apical and basal constrictions. Pronotum 1.8 times longer than prosternum, in profile 1.3 times longer dorsally than thick. Surface of pronotum with obsolete punctures between the scales.

Elytra 2.6 times longer than prothorax, elytra across humeri 1.3 times wider than prothorax. Elytra straight across base, humeri prominent, rather abruptly right-angled, sides appearing parallel, but actually very slightly divergent from base to apical three-fifths, thence gradually convergent to apex, the slightly produced apical terminus of interval 5 interrupting the outline. Elytra in profile (Fig. 40) flat on basal fifth, thence very slightly arcuate to declivity which is abrupt, slightly oblique. Sutural interval moderately swollen at summit of declivity. Intervals 3, 5 and 7 slightly elevated from base to approximately apical third, the elevations accentuated by more numerous setae and more metallic color. Striae distinct, set with moderate, perfectly aligned punctures.

Fore and hind legs subequal, middle legs definitely smaller. Fore femur scarcely swollen, slightly bowed; fore tibia straight, slender, with five small teeth on inner edge.

Fore coxae separated by distance equal to width of antennal club. Anterior portion of ventrites 3, 4 and 5 (Fig. 15) abruptly, perpendicularly concave, the modification slightly arcuate and widest at middle, the edge subcarinate. Posterior-lateral angles of ventrites 2 and 3 slightly elongated, hooking over the edge of the elytra. Ventrite 5 feebly convex along median line with a shallow concavity on either side of median line at base.

Type series. - Holotype, female, Grand Cayman, W. Indies, 25 August 1908, Dr. M. Cameron, BM 1936-555, M. Cameron Journal W. I. 1178 (BM). Paratypes, 2 females. GRAND CAYMAN: 1 female, same data as holotype (BM); 1 female, June 1962, T. H. Farr (Inst. Jam.).

Discussion. - The two paratypes range in length from 3.5 to 3.6 mm. and

in width from 1.3 to 1.4 mm. Neither is as well marked as the holotype; in one the elytral fascia is obsolete; in the other it is well-developed but less conspicuous because of additional dark brown spots over the disc. The extreme plumpness of the beak in the type series could partly be attributable to particularly robust specimens. There is no trace of the oblique ridges on the beak as found in subtropicus. The prothorax is a little more convex in both paratypes and the apical constriction is quite distinct on the disc in one. In both paratypes the prothorax is very slightly longer than wide, thus lessening the relative width compared to that of the base of the elytra; the length of the pronotum versus the elytra is nearly the same as in the type.

In addition to the characters listed in the diagnosis, caymani also differs from subtropicus in its flatter elytra with a dark fascia where subtropicus has a white fascia; less swollen fore femora; larger eyes; and straight, perfectly aligned striae punctures.

8. Scalaventer jamaicensis, new species

Figures 19, 66.

Diagnosis. - Elytral intervals equal, evenly setate. Elytra broadly rounded apically. Aedeagus as long as ventrites 1 and 2 combined.

Description. - Holotype, male, length 2.5 mm., width 1.0 mm. Specimen with some scales abraded, missing tarsal claw on left middle leg, and aedeagus cracked at tip. Color dark brown, tan and white; mottled, the only pattern discernible being a vague pale "V" on apical third of elytra, this bordered anteriorly with dark. Scales contiguous or not, of irregular angular shapes, strongly margined and strongly reticulate. Setae inconspicuous, small (about as long as a scale), prostrate or slightly arched; uniserial on elytral intervals.

In profile, beak and frons flat to behind eyes, thence rather abruptly, obliquely angled to pronotum. Dorsally beak with sides slightly emarginate at base where it is 0.81 times as wide as head between eyes, sides thence strongly diverging apically, at apex as wide as head between eyes. Interantennal line unmarked. Beak with a shallow basal concavity; median line finely carinate from center of concavity to apex of epistoma, unmarked caudad of concavity. Apex of beak slightly deflected; scales apicad of concavity gradually becoming sparser, smaller, smoother and more convex; setae apicad of concavity erect, becoming longer. Apical emargination of beak arcuate, its apex obtusely angled; emargination occupying two-thirds of beak apically, marked by a weak carina and with two slender vibrissae on each side of base.

Epistoma with median line finely carinate. Scrobe obtusely angled, wider at angle; the vertical portion at its middle about equidistant between eye and apex, slightly tapered, curved, ending just before ventral surface beneath anterior edge of eye. Antenna with scape slightly bowed; club moderate, compact. Eye moderate, quite convex, protruding well beyond sides of head.

Prothorax as long as wide, sides gently rounded between basal and apical constrictions. Pronotum 1.7 times longer than prosternum; in profile 1.25 times longer dorsally than thick. Surface of pronotum with obsolete punctures between the scales.

Elytra 2.3 times longer than prothorax, elytra across humeri 1.2 times wider than prothorax. Base of elytra slightly arcuately emarginate. Elytra rather strongly convex transversely. Elytra with sides slightly divergent from humeri to middle, thence broadly rounded to apex; the broadly rounded apical terminus of intervals 4 to 6 interrupting the outline. Elytra in profile (Fig. 19)

distinctly arcuate from base to apex, highest medially; declivity slightly indicated, oblique, slightly concave. Elytral intervals equal, slightly convex especially basally and medially. Striae set with moderate, perfectly aligned punctures.

Fore leg only slightly longer than other legs; fore femur scarcely swollen; inner edge of fore tibia with only one distinct denticle and some serrulation.

Fore coxae separated by distance equal to approximately three-fifths the width of the antennal club. Anterior portion of ventrites 3, 4 and 5 abruptly, perpendicularly concave, the modification slightly wider medially, the edge not carinate. Ventrite 5 slightly convex, its apex broadly rounded and with a small median emargination.

Aedeagus (Fig. 66) as long as ventrites 1 and 2 combined, slightly arcuate, approximately four-fifths as wide as antennal club; apical opening elongate-elliptical, its apex briefly truncate.

Allotype, female, length 3.2 mm., width 1.4 mm. Specimen with left fore tibia and tarsus mounted on point. Color and pattern similar to holotype. Differs from holotype in the following respects. Beak in profile thicker; head and beak more robust. Beak with carina of median line obsolete. Apex of beak less deflected than in holotype. Apical emargination deep, arcuate, its apical angle obsolete; epistoma with median line obsoletely carinate; a row of four vibrissae on each side of apical emargination, and two small vibrissae arising from epistoma itself. Elytra 2.5 times longer than prothorax. Elytra with sides broadly rounded from about basal sixth to apical terminus of intervals 4 to 6, the apex slightly attenuated beyond this. Elytra in profile with declivity more evident, its summit well below the highest part of the elytra due to their convexity. Sutural interval somewhat enlarged at summit of declivity. Fore tibia with four denticles on inner edge. Fore coxae separated by distance equal to width of antennal club. Anterior modifications of ventrites as in holotype but more abrupt. Ventrite 5 nearly flat, its apex narrowly rounded.

Type series. - Holotype, male, Port Henderson, St. Catherine Parish, Jamaica, 28 September 1945, E. L. Sleeper Collector (Long Beach). Allotype, female, Port Henderson Hill, St. Catherine Parish, Jamaica, 11 March 1959, T. H. Farr (Inst. Jam.). Paratypes, 2 males, 4 females. JAMAICA: 1 female, same data as holotype (Long Beach); 1 male, 2 females, same data as allotype (Howden, Inst. Jam.); 1 male, Ewarton, St. Catherine, 28 September 1945, E. L. Sleeper Collector (Sleeper); 1 female, Portland Ridge, Clarendon, 6 July 1962, T. H. Farr (Inst. Jam.).

Discussion. - Males vary in length from 2.3 to 2.5 mm. and are 0.9 mm. wide; females vary in length from 2.3 to 3.2 mm. and in width from 1.1 to 1.4 mm. The only additional color pattern evident in the paratypes is a dark median vitta on the vertex. One female paratype has the scales neither margined nor reticulate but granular. The beak is usually as described for the holotype rather than the allotype. Average number of denticles and teeth on the inner edge of the fore tibia is three. The elytra are variable in relative width giving them a disconcertingly different habitus; at their widest point the elytra vary from 1.1 to 1.4 times wider than their humeri. The declivity of the females in profile also is variable; in two paratypes it is as in the allotype and in the other two is less well-marked. The anterior modification of ventrite 5 is subcarinate in one female. In the males the apex of ventrite 5 is not emarginate in one specimen and obsoletely emarginate in the other.

Scalaventer jamaicensis seems most closely related to caymani (known from Grand Cayman) and convexifrons (known from the Bahama Islands), though geographically it is more apt to be confused with coccolobae. From

convexifrons, jamaicensis may be separated by its much shorter aedeagus and shorter, broader elytra. From caymani (and subtropicus) it is readily distinguished by its nearly flat, even elytral intervals. From coccolobae, jamaicensis may be separated by its more widely separated fore coxae, scarcely enlarged fore femora and noncarinate ventral modifications. In habitat, jamaicensis is closest to coccolobae; jamaicensis is known from low hills in southern Jamaica and coccolobae from low hills over much of the island, the known ranges being most approximate west of Kingston.

9. Scalaventer convexifrons, new species

Figures 21, 58, 67.

Diagnosis (based on male). - Aedeagus as long as entire abdomen. In profile, head prominently swollen above eyes.

Description. - Holotype, male, length 3.0 mm., width 1.1 mm. Color black, white and tan, marked as follows: sides of beak and head white except for broad dark vitta behind eye to pronotum, remainder of head mottled; pronotum with a white vitta either side of median line; elytra with intervals 2 and 3 white on basal fifth; elytra with an irregular, conspicuous, white "V" on apical half, bordered anteriorly with black; intervals 5, 7 and 8 black on declivity before apex; remainder of elytra including epipleurae mottled; legs indistinctly annulate. Scales angular, contiguous or not, obsolete to finely margined, granular; white scales less strongly sculptured but often subpustulate towards declivity. Setae of frons and prothorax completely, slightly arched, as long as one to one and a half scales; setae of head behind convexity prostrate, very inconspicuous; setae of elytra becoming incompletely arched towards side and apex; uniserial on elytral intervals.

In profile (Fig. 58), beak and frons obsolete to above middle of eye where head is prominently convex, thence flat, oblique (slightly more than 45°), slightly elongate to pronotum. Beak with sides slightly converging from over insertion of antennae to base where it is 0.92 times as wide as head between eyes; sides rapidly, briefly converging apicad of insertion of antennae, thence parallel for a short distance. Dorsum of beak obsolete to concave, median line finely impressed from base to between middle of eyes. Interantennal line unmarked, apex of apical emargination reaching interantennal line. Apical emargination right-angled, occupying approximately three-fifths of the apical edge of beak; emargination obsolete to carinate, except at apex where it is slightly elevated, a fine carina extending from apex to base; with a row of six relatively short vibrissae each side of emargination; apical edge of beak reflexed and broadly glabrous either side of emargination. Scrobe obtusely angled, wider at angle, the vertical portion about equidistant between eye and apex, tapering rapidly and ending well above ventral surface beneath anterior edge of eye. Antenna with scape slightly bowed; club moderately large, elongate, slightly "loose" because of slight constriction at base of segments 2 and 3. Eye moderately small, quite convex, well separated from dorsal surface, approximately equidistant between dorsal surface, ventral surface and prothorax.

Prothorax as long as wide, sides rounded between constrictions, apical constriction 1.2 times wider than basal constriction. Pronotum 1.6 times longer than prosternum; in profile, 1.2 times longer dorsally than thick. Punctures obsolete on disc becoming moderate on sides.

Elytra 2.4 times longer than prothorax, elytra across humeri 1.3 times

wider than prothorax. Elytra nearly straight across base. Elytra with sides parallel to middle, thence gradually converging to apex, the apical terminus of intervals 4 to 6 scarcely interrupting outline. In profile (Fig. 21), disc of elytra weakly arcuate from base nearly to apex, the summit of declivity obsolete, the declivity oblique, straight. Elytral intervals equal, very slightly convex beyond basal third. Striae set with moderately small punctures, slightly irregularly aligned on basal third.

Fore legs only slightly longer than other legs; fore femur scarcely more swollen than hind femur; fore tibia straight, inner edge with four distinct, moderate teeth on right tibia, five on left tibia.

Fore coxae separated by distance equal to the greatest width of the antennal scape, approximately one-half the width of the antennal club. Anterior modification of ventrites 3, 4 and 5 abrupt, perpendicular, slightly wider medially; gradually becoming more elevated medially, the edge not carinate. Ventrite 5 rather strongly convex longitudinally, apex rounded.

Aedeagus (Fig. 67) as long as entire abdomen measured medially, about as thick as thickest part of scape, slightly more strongly arcuate for basal half; apical opening short, oval, apex briefly truncate.

Type series. - Holotype, male, West side Port Nelson, Rum Cay, Bahama Islands, 6 April 1965, B. D. Valentine, R. W. Hamilton Collectors (AMNH, temporarily Valentine). No paratypes.

Discussion. - Scalaventer convexifrons appears to be most closely related to jamaicensis which is particularly similar in its head and beak. However, convexifrons has the head much more swollen than any other Scalaventer and consequently the eye approximately equidistant between the dorsal and ventral surfaces. Note that the head and prothorax are slightly tilted to the right side in the photograph (Fig. 21), slightly distorting the true profile; figure 58 depicts the profile accurately. The much longer aedeagus of convexifrons is, of course, a more decisive character, but for females the swelling over the eyes and narrower, longer elytra will probably readily distinguish convexifrons from jamaicensis. Series of convexifrons are needed to determine whether or not the larger and more numerous tibial teeth and the shorter, narrower scrobe are reliable characters.

The swollen frons (Fig. 58) and therefore the eye remote from dorsal surface are generic characters of Pandeleteinus (Fig. 57); in this context the critical characters of S. convexifrons are: scrobe not reaching ventral surface, eye distant from pronotum, anterior modification of ventrites 3, 4 and 5 strongly developed, and fore coxae relatively widely separated.

Geographically, convexifrons is the most remote of all the Scalaventer and is the only species known from the Bahama Islands.

10. Scalaventer gelinasus, new species

Figures 9, 11, 22.

Diagnosis (based on female). - Beak very short and robust; apex abruptly deflected so that epistoma is perpendicular to dorsum; scrobes encroaching upon dorsum so that at narrowest point dorsum is only half as wide as head between eyes.

Description. - Holotype, female, length 3.7 mm., width 1.4 mm. Specimen teneral with mandibular cusps still attached. Color testaceous because of teneral condition, only white markings distinct. Marked with white in a frontal spot, four small spots across middle of prothorax, a faint "V" on apical third of elytra and a spot on sutural interval at summit of declivity. Scales

finely to obsoletely margined, coarsely to finely granular. Setae as long as one and one-half scales; completely, slightly arched, becoming incompletely arched towards apex and sides; more numerous on elytral intervals 3, 5 and 7.

In profile, head and beak very short and robust, apex of beak abruptly truncated; beak thicker than long; dorsum of head and beak flat, gently arcuate over caudal half of eyes. Dorsal surface of beak (Fig. 9) apically reduced in size, widest over insertion of antennae where sides of beak are 1.5 times wider than dorsum; narrowest at base where the converging apices of the scrobes reduce dorsum to 0.5 times as wide as head between eyes and where sides of beak are 2.4 times wider than dorsum; apical edges of dorsum strongly converging from insertion of antennae to apex of epistoma, the sides here falling off rapidly; median line deeply impressed from interantennal line to beyond middle of eyes. Interantennal line unmarked. Apical emargination approximately right-angled, carinate, the carina extending caudally for a short distance; with a row of seven conspicuous, apically-directed vibrissae on each side; epistoma small, nearly perpendicular to dorsum, entire anterior edge of epistoma slightly arcuately emarginate. Scrobe with horizontal portion almost non-existent; vertical portion strongly bowed towards apex of beak, slightly closer to apex of beak than to eye, ending before ventral surface in front of anterior edge of eye. Scape strongly bowed to accommodate curvature of beak. Antennal club moderate in size, first segment with slightly elongate base. Eye moderately small, moderately convex.

Prothorax 1.1 times longer than wide, sides gently rounded between constrictions; basal constriction close to base. Pronotum 1.8 times longer than prosternum; in profile disc slightly arcuate between constrictions, apical constriction obsolete on disc. Punctures small, moderately deep.

Elytra 2.6 times longer than prothorax; elytra across humeri 1.4 times wider than prothorax. Base of elytra nearly straight. Elytra with sides parallel for basal seventh, thence slightly divergent to beyond middle, thence convergent, gently rounded to apex, apical terminus of intervals 4 to 7 moderately conspicuously interrupting outline; apex broadly, slightly truncate. In profile (Fig. 11), elytra very slightly, evenly arcuate to summit of declivity which is rather broadly rounded; declivity slightly oblique. Basal seventh of intervals 2 to 5 conjointly convex. Intervals 3, 5 and 7 slightly more elevated and wider apicad of basal seventh, otherwise intervals equal on disc. Striae set with small, moderately deep punctures.

Fore leg slightly larger than hind leg; fore femur with swelling moderately weak, gradual. Inner edge of fore tibia with six moderate to large teeth and a few minute denticles.

Fore coxae separated by distance approximately equal to the width of the antennal club. Abdomen (Fig. 22) with modification of anterior portion of ventrites 3, 4 and 5 deep, but oblique rather than perpendicular to surface, edges not carinate, slightly arcuate for central two-thirds in ventrites 3 and 4, less arcuate in ventrite 5. Ventrite 5 strongly, longitudinally convex for its entire length; apex deflected, rather narrowly rounded.

Type series. - Holotype, female, Loma Rucilla and mountains North, Dominican Republic, June 1938, 5-8000 feet, Darlington (MCZ). No paratypes.

Discussion. - Variation may be expected (particularly in males) in color and color pattern, relative robustness of the head and beak, and contour of declivity. Females will probably show some variation in the abdominal modifications, but the modifications will probably always be slightly arcuate, oblique and not carinate. The longitudinal convexity of ventrite 5 of females is undoubtedly stable, and this character is unique for the genus.

S. gelinasus may be distinguished from other Scalaventer by the following characters: extremely short, robust beak and consequently with horizontal portion of scrobes nearly absent, dorsal surface strongly constricted basally to one-half the width of head between eyes, scape strongly bowed, epistoma perpendicular to dorsum of beak; slightly oblique declivity; females with modification of anterior portion of ventrites 3, 4 and 5 slightly arcuate and not carinate; ventrite 5 longitudinally convex, the convexity extending to sides.

Of other West Indian tanymecines with a dorsally strongly constricted beak, Isodrusus has connate claws and S. valkyrius has the summit of the elytral declivity produced, elytral intervals 2 and 4 without setae on disc, and the female abdominal modification carinate.

S. gelinasus is the only species of Scalaventer known from Hispaniola. Other tanymecines on the island are Polydacrys with semi-enclosed corbels and stalked mandibular scars and three Paululusus species which have scarcely modified ventrites. S. gelinasus has the weakest modification of the ventrites in the genus, but, as is seen in the photograph (Fig. 22), the modification extends the entire width of the abdomen and when compared to Paululusus is strong indeed.

11. Scalaventer valkyrius, new species

Figures 12, 23, 24.

Diagnosis (based on female). - Beak very short, horizontal portion of scrobe greatly reduced. Sutural interval produced posteriorly at summit of declivity.

Description. - Holotype, female, length 2.6 mm., width 1.0 mm. Color black, white and cupreous, marked as follows. Head cupreous with dark triangle on vertex. Pronotum predominantly cupreous, faintly mottled. Elytra bright cupreous; sutural interval darker, somewhat mottled, the dark area extending to stria 4 on basal seventh; a conspicuous white lunule on intervals 5, 6 and 7 at basal third, the lunule broadly bordered in black; a slightly oblique, broad, white fascia on apical third bordered anteriorly with black. Scales of various shapes, often rounded, not contiguous, strongly margined, coarsely granular. Setae of head and pronotum small and inconspicuous except between eyes and on apex of pronotum where they are completely arched, scarcely elevated, as long as one and one-half to two scales. Setae of elytra completely arched but higher than those of head and pronotum, as long as two scales; setae of summit of declivity incompletely arched; setae uniserial; absent on intervals 2 and 4 except on declivity, sparse on interval 6.

In profile, beak and head flat from apex to over eye where it is gradually, gently rounded, thence less rounded to pronotum; beak thicker than long (Figs. 12, 23). Beak very short, approximately half as long as distance between eyes. Dorsum of beak obsoletely concave, median line briefly marked with slight groove; dorsal edge of beak excavate over scrobe, at its narrowest point 0.7 times narrower than head between eyes. Interantennal line unmarked; apical of line beak deflected, without scales, with straight, slender vibrissae. Apical emargination slightly obtusely angled, occupying approximately one-half the apical edge of the beak, finely carinate, a short, fine carina extending from apex to interantennal line; with a row of three vibrissae on each side of emargination. Scrobe broad at angle, antenna inserted above anterior edge of vertical portion, the horizontal portion extending anteriorly only very briefly beyond insertion; dorsal edge of horizontal portion strongly sinuate; vertical

portion slightly bowed, about equidistant between eye and apex at its narrowest point, deep and well-defined to its termination on ventral surface beneath anterior edge of eye. Scape slightly bowed to accommodate curvature of beak. Antennal club moderate in size, first segment with slightly elongated base. Eye moderately small, only moderately convex, in anterior view only slightly exceeding the robust head.

Prothorax 1.1 times longer than wide, sides gently rounded between constrictions. Pronotum 2.0 times longer than prosternum; in profile, disc slightly arcuate between constrictions, the apical projection nearly three times as long as the basal. Punctures small, shallow on disc, becoming moderate on sides.

Elytra 2.3 times longer than prothorax, elytra across humeri 1.3 times wider than prothorax. Base of elytra slightly, arcuately emarginate between striae 5. Elytra with sides weakly divergent to about middle, thence convergent, gently rounded to apex, the apical terminus of intervals 4 to 6 obsoletely interrupting outline. In profile (Fig. 23), elytra nearly flat for basal fifth, thence very slightly arcuate to apex of declivity; declivity with approximately dorsal third directed slightly, obliquely inwards, remainder directed slightly apically, the apex of elytra scarcely exceeding the apex of the declivity. In posterior view elytra rather strongly convex. Elytral striae set with small punctures; elytral intervals nearly equal, intervals 3 and 5 obsoletely enlarged on disc.

Fore leg slightly larger than hind leg; fore femur moderately swollen, the swelling gradual basally, moderately abrupt distally. Fore tibia slender throughout, slightly bowed, with six minute denticles on inner edge.

Fore coxae separated by approximately the width of the antennal club. Abdomen with posterior-lateral edge of ventrite 2 slightly enlarged and overlapping edge of elytra. Modification of anterior portion of ventrites 3, 4 and 5 (Fig. 24) deep throughout, but arcuate for only approximately median two-thirds, slightly elevated and carinate, the modification strongest on ventrite 5. Ventrite 5 flattened, slightly convex basally, apex broadly rounded.

Type series. - Holotype, female, Hardwar Gap, Jamaica, 4000 feet, 29 July 1966, A. T. Howden, not on Cyrrilla (Howden). No paratypes.

Discussion. - When additional specimens of this species are found, they will probably exhibit variation in the color pattern, general contours of the elytra and details of the vestiture. Males may have a more slender head, slightly larger eye, more enlarged fore leg, more closely placed fore coxae, and possibly a reduced swelling at the summit of the declivity.

S. valkyrius can be distinguished by the following combination of characters: beak very short, horizontal portion of scrobe greatly reduced; sutural interval produced posteriorly at summit of declivity; intervals 2 and 4 on disc without setae; ventrite 5 of female with anterior modification strongly arcuate and elevated on central two-thirds. S. remotus has a similar declivity and strikingly similar color pattern, but has all intervals setate and a long beak with long, gently angled scrobe. S. litoreus and montanus females have the modification of ventrite 5 arcuate but they are never as strongly arcuate or as strongly carinate as in valkyrius; litoreus and montanus may also be distinguished from valkyrius by their robust form and broad, flat beak with gently curved scrobe. The abdomen of Isodrusus guajavus is very close to that of S. valkyrius, and both species also have similar beaks and scrobes; the connate claws and narrower beak of Isodrusus will immediately separate it from Scalaventer.

The holotype was taken at the end of a month's collecting at Hardwar Gap when a particular effort was made to collect weevils on trees other than the

common hosts of Scalaventer.

12. Scalaventer cubensis, new species

Figures 18, 41, 42, 64.

Diagnosis (based on male). - Dorsum of beak long, narrow, parallel-sided, gradually deflected apicad of interantennal line, scales typical nearly to apex. Apical emargination small, occupying only one-third of apical width of beak.

Description. - Holotype, male, length 3.1 mm., width 1.2 mm. Color pale tan; elytra slightly mottled, sutural interval somewhat cupreous from basal fifth to apex. Scales of irregular shapes, mostly angular, contiguous, finely to moderately granular, obsoletely to moderately margined; scales of sutural interval becoming pustulate about middle, some additional pustulate scales on declivity especially on alternate intervals. Setae completely arched, scarcely elevated, as long as one and one-half to two scales; setae of elytra uniserial and evenly distributed except on sutural interval at summit of declivity where they are more numerous.

In profile (Fig. 41), beak gently deflected apicad of insertion of antennae, flat to above middle of eyes, thence gently, evenly arcuate to pronotum. Head (Fig. 42) narrow between eyes; beak approximately same width as head between eyes, relatively long and narrow, sides nearly parallel. Beak 1.2 times wider than long. Median line rather deeply impressed from interantennal line to middle of eyes; dorsum of beak slightly longitudinally convex either side of midline. Interantennal line unmarked. Scales apicad of interantennal line gradually becoming smooth and convex but scarcely less dense than typical scales. Apical emargination small, approximately right-angled, occupying approximately one-third of apical edge of beak, apex well removed from interantennal line; emargination marked by a very weak carina and a single vibrissa on either side. Scrobe with dorsal and posterior edge forming a right-angle; horizontal portion almost as long as vertical portion; very wide at angle; vertical portion tapering rapidly to a point closer to eye than to apex of beak, ending well above ventral surface beneath anterior edge of eye. Scape gradually thickened from base, very slightly bowed; antennal club moderate, compact. Eye moderately large, moderately convex, facets relatively small.

Prothorax 1.2 times longer than wide, sides only slightly rounded between constrictions. Pronotum 1.6 times longer than prosternum; in profile, 1.5 times longer dorsally than thick, disc slightly arcuate. Surface with punctures shallow on disc becoming moderately deep on sides. Anterior edge of pronotum with a compact row of seven anteriorly-directed scales at the site where ocular vibrissae are situated in continental tanymecines.

Elytra 2.1 times longer than prothorax, elytra across humeri 1.3 times wider than prothorax. Elytra approximately straight across base. Elytra with sides parallel for basal fifth, from there very slightly diverging to just beyond middle, thence rounded to apex, the apical terminus of intervals 4 to 6 broadly interrupting outline. Elytra in profile scarcely arcuate; summit of declivity broadly rounded, declivity slightly oblique, slightly concave. Intervals 3, 5 and 7 obsoletely elevated, otherwise intervals even. Striae closely set with moderately deep, perfectly aligned punctures.

Legs long and slender, fore legs longer but relatively scarcely thicker. Fore tibia with six distinct, large teeth on inner edge.

Fore coxae separated by distance equal to approximately four-fifths the width of the antennal club. Abdomen densely squamose, the scales little differ-

ent from those of dorsum. Anterior portion of ventrites 3, 4 and 5 (Fig. 18) perpendicularly concave, deep throughout, the edge not carinate, the squamose portions slightly elevated anteriorly medially. Ventrite 5 moderately convex, its apex truncate-emarginate.

Aedeagus (Fig. 64) gently, evenly arcuate, as long as first two and one-half ventrites measured medially, thickened apically; apical opening broadly elliptical.

Type series. - Holotype, male, Coast below Pico Turquino, Cuba, 26-30 June 1936, Darlington (MCZ). No paratypes.

Discussion. - In females the beak will probably be wider, on the sides especially, but the rounded apex with its nearly typical scales and very small epistoma should be fairly constant. The moderately deep stria punctures of the type may be considerably moderated in females. It will be interesting to see the condition of the ocular vibrissae site in additional specimens.

S. cubensis appears to most closely related to jamaicensis, by virtue of its aedeagus being shorter than the combined length of ventrites 1 to 3; its scarcely enlarged fore legs; its short, truncated elytra; and its nearly equal elytral intervals. From jamaicensis, cubensis may be separated by its much smaller epistoma, narrower beak, more strongly dentate fore tibiae, and shorter apical opening of the aedeagus.

Paululusus, new genus

Size small, usually between 2 and 3 mm. in length. Body and legs covered with scales and small setae. Beak deflected from head by less than 90° , slightly wider than long, dorsal surface flattened, sometimes slightly concave thence slightly convex apicad of interantennal line which may or may not be marked by a short glabrous line. Apex of beak triangularly emarginate, the emargination marked by a fine carina posteriorly and occupying between one-third and two-thirds of the width of the beak anteriorly; apical edge of epistoma emarginate. Sides of beak nearly vertical; scrobes deep, obtusely or nearly right-angled, not reaching ventral surface, the vertical portion approximately equidistant between eye and apex of beak. Antennal scape without scales, reaching middle of eye; funicle seven-segmented; first segment longer than others which are subequal or equal; club short to moderate, narrowly to broadly elliptical. Frons not swollen in lateral profile. Eye small to moderate in size, strongly convex and protruding, nearly hemispherical in some males, situated at extreme anterior edge of head close to dorsal surface. Prothorax a little longer than wide, feebly convex between basal and apical constrictions which are moderate on the sides, weaker on the disc. Pronotum produced anteriorly over head; apical margin without ocular vibrissae, teeth or lobes. Elytra with humeral angles well-developed or not. Stria 10 obsolete medially. Fore leg larger than other legs; fore femur swollen or not, fore femur without teeth or serrations on inner edge; fore tibia dentate on inner edge. Fore coxae separated by a distance equal to approximately one-third to one-half the width of the antennal club, more widely separated in female than in male. Hind tibia with corbel open. Tarsi completely padded; tarsal claws free. Abdomen with the anterior portion of ventrites 3, 4 and 5 weakly modified, at most narrowly glabrous and narrowly concave. Aedeagus very slender and longer than the first four ventrites measured medially, sometimes longer than all five ventrites.

Type-species. - Paululusus calypso new species.

The name Paululusus is masculine and refers to the miniature appearance

of the insects.

Discussion. - Paululus is most closely related to the continental neotropical genus Pandeleiteinus Champion. The major differences between the two genera are as follows. Paululus (Fig. 51) has the frons not swollen, the head evenly arcuate in profile, eyes close to dorsal surface, ocular vibrissae absent, scrobe not reaching ventral surface, and fore coxae separated by one-third to two-thirds the width of the antennal club. Pandeleiteinus (Fig. 57) has the frons transversely swollen, the head and frons consequently usually sinuate in profile; eyes distant from dorsal surface; ocular vibrissae present; scrobe reaching ventral surface (except in submetallicus (Schffr.)); fore coxae contiguous or very narrowly separated.

In addition, there are several secondary distinguishing characteristics. The dorsal surface of the tarsi, the articulating surface of the corbels and, to a lesser extent, the scape are all densely squamose in Pandeleiteinus; in Paululus there are no scales or only scattered scales in these places. The size of Pandeleiteinus ranges from 2.7 to 4.5 mm; Paululus ranges from 2.0 to 3.2 mm. The aedeagus of Pandeleiteinus is often as long proportionately as in Paululus but it is generally thicker. Pandeleiteinus always has a much broader beak than Paululus; this is too difficult to describe objectively to be useful, but when specimens are available for comparison, the difference is conspicuous. Pandeleiteinus is known from southwestern United States and Mexico. Paululus is known only from Hispaniola.

Paululus is also related to Isodacrys, the apterous Paululus constanzae n. sp. in particular resembling an Isodacrys. In Paululus the apterous condition is a specific and not a generic character. Isodacrys is known only from the continental Neotropics and is characterized by short, fused elytra without humeri and by the absence of wings. Isodacrys differs from Paululus in: its scrobe reaching the ventral surface; aedeagus much stouter; beak broader and parallel-sided; tarsi, scape and corbels densely squamose; and ventrites more strongly modified. For a discussion of these genera in reference to the apterous condition see the Introduction.

Paululus differs from Scalaventer in having the modification of the anterior portion of ventrites 3, 4 and 5 never abruptly concave across the entire width of the abdomen and never with the edge carinate.

Nothing is known of the ecological requirements of the species of Paululus other than that revealed by the labels on the specimens. Paululus constanzae was collected in the remote interior mountains between 3000 and 5000 feet; calypso and hispaniolae are known from numerous localities at sea level up to about 2000 feet, along the coast and in the interior (see Map 4). One species, hispaniolae, was collected on "calmite". Specimens of calypso and hispaniolae were collected together by beating branches in a semi-desert area; calypso was also taken by sweeping a weedy, bushy hillside. One specimen of hispaniolae was collected on "flowering plants". This indicates that adults of Paululus like those of Isodacrys and Pandeleiteinus feed principally on herbaceous plants and bushes, whereas Scalaventer and Pandeleiteius feed principally on trees.

Key to the Species of Paululus

1. Elytra with setae inconspicuous, completely arched; sutural interval swollen at summit of declivity; declivity abrupt.
- 2. hispaniolae, new species (p. 36)
- Elytra with setae conspicuous, erect; sutural interval not swollen at summit of declivity; declivity gradual. 2

2. Humeri well-developed; elytra not fused; wings fully developed.
 1. calypso, new species (p. 34)
 Humeri absent; elytra fused; wings absent.
 3. constanzae, new species (p. 38)

1. Paululus calypso, new species

Figures 27, 29, 54, 68.

Diagnosis. - Elytra with well-developed humeri; elytral intervals each with a row of erect setae.

Description. - Holotype, male, length 2.2 mm., width 0.7 mm. Body and legs covered with pale brown and pale green scales; the dorsum predominantly pale brown, the sides of head, thorax and elytra mostly green. Marked with brown in a broad median thoracic vitta which continues, tapering over head to between eyes; elytra with a short basal vitta on intervals 5 and 6. Scales of dorsum and legs not contiguous, finely granular, not margined, of irregular polygonal shapes; scales of head, beak and tibiae more rounded in shape. Scales of declivity with a metallic lustre. Scales of ventrum pale green or opalescent, contiguous or overlapping, rounded in shape. Elytral intervals each set with a row of short, blunt, erect setae; setae of elytral declivity much more numerous; setae of beak like those of elytra, numerous; setae of frons semi-erect; setae of head and pronotum inconspicuous, fine and nearly prostrate.

In profile, head sub-spherical, beak rather thin, feebly arcuate over scrobes. Beak slightly narrower than head between eyes, with sides approximately parallel; dorsal-lateral edge rounded between head and antennal insertion, abrupt and slightly convex over horizontal portion of scrobe. Beak obsoletely concave from base to interantennal line, thence feebly convex; interantennal line marked only by a brief glabrous area either side of median line. Median line of beak marked with a feeble, glabrous carina from apex to interantennal line from whence it is marked by a fine, deep groove terminating beyond middle of eyes, almost contiguous with the dark median vitta of vertex. Apical emargination approximately right-angled, occupying approximately one-half of the width of beak apically and marked posteriorly by a fine but distinct carina. Scrobe deep, obtusely angled, vertical portion closer to eyes than to apex of beak, feebly curved posteriorly and ending beneath anterior edge of eye before the ventral surface. Antenna with scape straight, clavate; funicle with first segment robust, conical; segments 2 to 7 subcylindrical, increasingly broader and shorter; club elliptical with apex acute. Eye moderate in size, strongly convex, thickest posteriorly.

Prothorax 1.05 times longer than wide, sides gently rounded between constrictions. In profile pronotum slightly convex; pronotum 1.6 times longer than prosternum. Surface of pronotum between constrictions with small, deep foveae separated from each other by one scale.

Elytra 2.4 times longer than prothorax; elytra across humeri 1.3 times wider than prothorax. Elytra with humeri rounded, right-angled, base obsoletely, arcuately emarginate; sides of elytra slightly divergent from humeri to middle thence rounded to apical eighth, the apex attenuate beyond this. Elytra in profile with disc rising slightly from base to beyond middle, thence gently rounded to apex, the declivity weak, vague; epipleura slightly emarginate opposite hind coxa. Elytral striae not prominent, set with small punctures which are separated from each other in the striae by one scale. Sutural interval

narrow, as wide as one scale; other intervals equal, as wide as two to three scales; all intervals flat or nearly so, except interval 10 on apex.

Fore leg definitely longer than hind leg, middle leg definitely shorter than hind leg. All legs with femora swollen medially, tibiae slender, tarsi long. Fore leg (Fig. 54) with femur grossly, abruptly swollen; tibia with four teeth and several denticles on inner edge.

Fore coxae separated by a distance equal to approximately one-third the width of the antennal club. Anterior portion of ventrites 3, 4 and 5 narrowly glabrous across their entire width, slightly concave medially. Ventrites 2, 3 and 4 with their posterior margins slightly convex. Ventrite 5 slightly convex, its apex without scales and set with many fine hairs, its apical margin truncate and slightly emarginate medially.

Aedeagus (Fig. 68) bent in type, approximately as long as entire abdomen. Aedeagus very slender, about as wide as thickest part of scape; cylindrical; apical three-fifths straight, basal two-fifths gently arcuate; apex in lateral view slightly less than a 45° angle; apical opening in dorsal view elliptical.

Allotype, female, length 2.8 mm., width 1.1 mm. Similar to holotype except in the following respects: head and beak (Fig. 29) more robust especially in profile; sculpture of beak slightly weaker. Prothorax approximately 1.2 times longer than wide. Elytra (Fig. 27) much more attenuate, 2.7 times longer than pronotum. Legs scarcely different from holotype. Fore coxae more widely separated, i. e., by approximately half the width of the antennal club. Anterior portion of ventrites 3 and 4 glabrous across their entire width but in only a thin line, the glabrous area scarcely concave. Ventrite 5 elongate, its sides converging from base and its apex narrowly rounded; convex along median line and with a large depression on either side; only 12 atypical scales on convexity; the surface granular and set with fine hairs as long as the elytral setae.

Type series. - Holotype, male, Port au Prince, Haiti, 1 March 1908, Dr. M. Cameron, B. M. 1936-555 (BM). Allotype, female, same data as holotype (BM). Paratypes, 16 males, 19 females. HAITI: 5 males, 14 females, same data as holotype (BM, Howden); 1 female, Diquini, W. M. Mann (MCZ); 1 female, 10 Km. N. of Ennery, 1000 feet, 12 July 1956, B. and B. Valentine, sweeping on bushy, weedy hillside (Valentine); 1 female, Hayti, Parish, 1899, Sharp Coll. 1905-313 (Howden); 10 males, 32 Km. SW Mirebalais, c500 feet, 5 July 1956, B. and B. Valentine, beating branches in semi-desert (Valentine, Howden); 1 male, Petionville, 1000 feet, 7 July 1956, B. and B. Valentine, sweeping on bushy hillside, late morning (Valentine); 1 female, Port au Prince, R. J. Crew, Wickham Coll. 1933 (USNM); 1 female, Mountains near Port au Prince, up to 2000 feet, 2 October 1934, Darlington (MCZ).

Discussion. - Males vary in length from 2.0 to 2.3 mm. and in width from 0.7 to 0.8 mm.; females vary in length from 2.4 to 3.0 mm. and in width from 0.9 to 1.1 mm. Variation in color and pattern is moderate, the minimum marking consisting of the median thoracic vitta only, the maximum markings as in the holotype plus a dark spot at the apical termination of elytral intervals 5 and 6, a short vitta on interval 4 before the declivity, and the sutural interval dark on the declivity. The holotype represents the usual color and markings. Color in one specimen is entirely without green and in another is entirely golden green dorsally. Sculpture of the beak is quite uniform with the median line more finely marked in females than in males and the interantennal line usually not marked by even a small glabrous area as in the holotype. The number of teeth on the fore tibia varies from three to six, with five being the usual number. The contour of the elytra in profile is not uniform within the

sexes, but the dorsal outline is uniform; the apex is always attenuate in females and always broadly rounded in males. The setae on the disc of the elytra seem particularly subject to abrasion, those of the declivity much less so.

The combination of erect elytral setae and the shape of the elytra in dorsal outline will separate this species from any other tanymecine known from the West Indies. The other two species in this genus have a pale median vitta on the pronotum where calypso has a dark median vitta. P. calypso also has more strongly and more abruptly swollen fore femora than the other Paululusus and the erect setae are much shorter in constanzae.

2. Paululusus hispaniolae, new species

Figures 28, 51, 52, 53, 70, 72.

Diagnosis. - Sutural interval swollen at summit of declivity, declivity conspicuous in profile. Usually with a pale, median, thoracic vitta.

Description. - Holotype, male, length 2.7 mm., width 1.0 mm. Color whitish and light brown marked as follows. Sides of beak, head, thorax and elytra whitish; pronotum with a pale median vitta bordered on either side by a broad, brown vitta; elytra with a complex pattern of short vittae on the disc and declivity. Legs feebly mottled; scales of ventrum opalescent or whitish. Scales of dorsum contiguous, moderate or small, of rounded shapes, granular, feebly pustulate, with weak to moderate reflexed margins. Setae of head, pronotum and elytra rather inconspicuous, except in profile, about as long as one scale, completely arched, uniserial on elytra.

In profile, head subspherical; beak rather short, stout, feebly arcuate. Dorsal surface of beak (Fig. 28) as wide as head between eyes, sides parallel except for a feeble emargination of the dorsal-lateral edge before head. Beak feebly, transversely convex over insertion of antennae, interantennal line otherwise unmarked; median line marked by a very fine impressed line from middle of eyes ending in a small but distinct fovea at beginning of interantennal convexity. Apical emargination acutely angled, occupying approximately one-half the width of the beak apically, marked posteriorly by a fine carina which extends caudad from apex for a very short distance. Anterior edge of epistoma with a median indentation. Scrobe obtusely angled, the horizontal portion slightly sinuate, the vertical portion curved and strongly tapered posteriorly, ending beneath anterior edge of eye well above ventral surface; vertical portion about equidistant between eye and apex of beak. Antenna with scape nearly straight, distal third swollen; funicle with first segment elongate, second segment one-half the length of the first; segments 3 to 7 subequal, subcubical, the distal segments broader than the basal ones; antennal club broadly elliptical. Eye rather large and only moderately convex.

Prothorax 1.1 times longer than wide, sides gently rounded between constrictions. In profile, pronotum slightly convex, pronotum 1.5 times longer than prosternum. Surface of pronotum between constrictions with small, deep foveae separated from each other by one scale.

Elytra 2.1 times longer than prothorax, elytra across humeri 1.3 times wider than prothorax. Elytra in dorsal view (Fig. 53) with humeri right-angled, base obsoletely bisinuate, sides very weakly divergent from humeri to apical third, thence gently rounded to apex, the apical termination of intervals 4 to 7 protruding slightly into the outline. Elytra in cross-section quite convex; elytra in profile feebly arcuate to summit of declivity. Declivity rounded at summit, thence slightly concave, the apex of the elytra extending slightly beyond

summit; epipleurae slightly emarginate opposite hind coxae, stria 10 obsolete here. Elytral striae distinct, set with moderate punctures which are separated from each other in the striae by one scale. Sutural interval at base as wide as one scale, gradually becoming broader posteriorly; at summit of declivity rather suddenly swollen and covered with four rows of circular, convex scales. Remaining elytral intervals slightly convex, subequal.

Fore and hind legs subequal in length, middle leg slightly shorter. Fore leg with femur moderately swollen, the swelling gradual basally, abrupt distally; fore tibia straight, slender, with three or four equidistant teeth on inner edge.

Fore coxae separated by a distance equal to approximately one-third the width of the antennal club. Anterior portion of ventrites 3 and 4 very narrowly glabrous across their entire width, slightly concave medially. Ventrites 2, 3 and 4 with their posterior margins slightly convex. Ventrite 5 slightly convex, its apex without scales and set with numerous fine hairs, its apical margin truncate and slightly emarginate medially.

Aedeagus almost as long as entire abdomen measured medially. Aedeagus slender, slightly wider than thickest part of scape; cylindrical; evenly, rather strongly arcuate; apex in lateral view at a 45° angle; apical opening in dorsal view elongate oval.

Allotype, female, length 2.9 mm., width 1.2 mm. Differs from holotype in the following respects. Color pattern more vivid and with fewer pustulate scales. Prothorax 1.5 times longer than wide; pronotum 1.6 times longer than prosternum. Elytra much more robust, 2.3 times longer than prothorax; elytra across humeri 1.45 times wider than pronotum, in dorsal view sides distinctly divergent from humeri to middle thence broadly rounded to declivity, apex a little narrower and slightly more attenuate. Apices individually rounded. Elytra in profile (Fig. 51) more arcuate on disc, declivity with sutural interval at summit more swollen and apex of elytra more attenuate; remaining elytral intervals flatter than in holotype. Fore coxae not appreciably more widely separated than in holotype. Ventrite 5 slightly convex along median line with a weak depression either side near base; covered with scales which are seldom contiguous; apex broadly rounded.

Type series. - Holotype, male, Port au Prince, Haiti, 1 March 1908, Dr. M. Cameron, B. M. 1936-555 (BM). Allotype, female, same data as holotype (BM). Paratypes, 22 males, 29 females. DOMINICAN REPUBLIC: 3 males, 4 females, Barahona, September 1938, Darlington (MCZ, Howden); 2 males, 3 females, San José de las Matas, 1000 to 2000 feet, June 1938, Darlington (MCZ, Howden). HAITI: 1 male, Damien, 8 November 1930, H. L. Dozier Collector, on Calmite, B. M. 1948-212 (Howden); 1 male, Damiens, Port au Prince, 9 September 1959, A. M. Nadler (AMNH); 1 male, 2 females, Gonaives, 4-9 February 1908, Dr. M. Cameron, B. M. 1936-555 (BM, Howden); 1 female, Jean Rabel, February 1929, E. C. and A. M. Leonard Collectors (USNM); 2 females, Manville, September 1926, Acc. 44-26, G. W. Wolcott Collector, B. M. 1948-212 (BM); 8 males, 6 females, 32 Km. SW Mirebalais, c500 feet, 5 June 1956, B. and B. Valentine, beating branches in semi-desert (Valentine, Howden); 4 males, 9 females, Port au Prince, same data as holotype (BM, Howden); 1 female, Port au Prince, R. J. Crew, Wickham Collector, 1933 (USNM); 1 female, Port au Prince, 12 December 1928, Acc. 319-28, A. Audant Collector (USNM); 1 male, Port de Paix, December 1928, E. C. and A. M. Leonard Collectors, on flowering plants (USNM); 1 male, Poste Terre Rouge, 2000 feet, 5 October 1934, Darlington (MCZ).

Discussion. - Males vary in length from 2.3 to 2.9 mm. and in width from 0.8 to 1.1 mm.; females vary in length from 2.6 to 3.2 mm. and in width from 1.0 to 1.3 mm. Variation in the series is great, even consider-

ing the wide distribution on Hispaniola. The aedeagus is particularly variable, but its extreme conditions cannot be correlated with other characters or with localities. In one extreme (Fig. 70) the apex of the aedeagus is simple; in the other extreme (Fig. 72) the base of the apex has a flange, a "collar", on either side. The simplest apex is found in specimens from Port au Prince, the type locality (see Map 4); the most strongly-developed collar is found in all specimens from San José de las Matas. However, specimens from Barahona, the extreme southeastern part of the range, have either a strong collar or an intermediate condition; likewise, the males from Gonaives and Port de Paix, at the northwestern extreme, have well-developed collars. Other specimens including the holotype exhibit various intermediate conditions.

Color and color pattern are highly variable, often giving specimens a very different appearance, but this is not unusual in New World Tanymecini. The allotype represents the maximum expression of the rather elaborate tan and white pattern. There are paratypes as well marked, but more often the pattern is considerably reduced to the vittate prothorax and a pale elytral spot on intervals 5 and 6 at the basal third. There are paratypes from most localities which are completely pastel green, blue-green or gray-green; in some of these, the scales, particularly at the base of the elytra, are incompletely developed. In a few specimens the scales are not margined. The angle of the apical emargination of the beak varies from right-angled to rather broadly obtusely angled, in the latter case occupying proportionately more of the width of the beak. The declivity varies moderately; Fig. 51 (allotype) represents close to the maximum development, Fig. 52 the weakest. The fore tibiae usually have five teeth on the inner edge and vary from three (as in the holotype) to six. The separation of the fore coxae is highly variable, the minimum being as in the holotype, the maximum being about two-thirds as wide as the antennal club as in some females.

The swollen sutural interval at the summit of the declivity is quite uniform in the series and will by itself distinguish this species from all other Paululusus.

3. Paululusus constanzae, new species

Figures 25, 26, 74.

Diagnosis. - Humeri absent, elytra fused and wings absent. Elytral intervals each with a row of erect setae.

Description. - Holotype, male, length 2.3 mm., width 0.8 mm. Dorsum and legs clothed with whitish and light brown scales arranged as follows: head pale except for a short brown median vitta on occiput; pronotum with a broad, somewhat irregular, pale median vitta bordered on either side by a broad, brown vitta; sides of prothorax mostly pale; elytra indistinctly marked but sutural interval on disc pale, base of intervals 6, 7 and 8 pure white, an obscure "V" of dark spots beginning about middle and extending to summit of declivity. Beak clothed with well-separated, smaller, rounded, smooth, submetallic greenish scales. Ventrums with smooth, shining, opalescent or submetallic greenish scales. Scales of dorsum and legs not contiguous (except humeral white spot and a few other dense white areas), finely granular, obsoletely margined, of irregular polygonal shapes; scales of declivity smaller, more rounded, smoother. Elytral intervals each set with a single row of erect, moderately long, slightly arcuate setae, those on disc separated from each other by three or more scales, those on declivity much more closely placed.

Setae of pronotum and occiput very fine, inconspicuous, prostrate; setae of frons and pronotum apicad of apical constriction thicker, more conspicuous (especially in profile), more numerous and completely or incompletely arched.

In profile, head subspherical, beak rather thin, its dorsum broadly arcuate. Head and beak (Fig. 26) with median line impressed from between eyes to inter-antennal line whence it is feebly carinate to apical emargination. Dorsum with a vague "Y"-shaped depression extending along median line and either side of apical emargination, the sides of beak convex over scrobes thus creating the arcuate profile. Beak slender, but by actual measurement wider over scrobes than head between the eyes; sides of beak conspicuously emarginate before head. Apical emargination small, occupying less than one-third the width of the beak anteriorly, acutely angled, marked posteriorly by a very weak carina. Epistoma with its apical edge irregular, truncate and with several scales encroaching upon it. Scrobe obtusely angled, the vertical portion slightly closer to eye than to apex of beak, ending just below ventral surface of eye. Antenna with scape nearly straight, distal third swollen; funicle with first segment conical, second segment elongate-oval and one-half the length of the first segment, segments 3 to 7 subspherical, distal segments larger; club elongate-elliptical. Eye moderate in size, moderately convex.

Prothorax 1.2 times longer than wide, sides moderately rounded between constrictions. In profile, pronotum convex, 1.8 times longer than prosternum. Surface of pronotum between constrictions with small punctures separated from each other by a scale.

Elytra (Fig. 25) 1.9 times longer than prothorax; elytra across humeri 0.9 times as wide as prothorax. Elytra fused, wings absent. Elytra narrow, elliptical, very slightly constricted at apical eighth with apex truncate. Base of elytra arcuate, humeri absent. Elytra in profile with disc nearly flat to apical third, thence gently, evenly arcuate to apex. Striae and intervals very poorly defined; striae punctures small and inconspicuous, their positions obscured by the arrangement of the scales; intervals discernible chiefly by the rows of setae, intervals on disc as wide as one to two scales, becoming as wide as two to four scales beyond third interval, especially apically.

Legs long and slender; fore leg conspicuously longer than hind leg, middle leg conspicuously shorter than hind leg. Fore femur moderately swollen, the swelling very gradual; fore tibia very slightly sinuate, its inner edge with four teeth and several denticles all situated on distal two-thirds.

Fore coxae separated by a distance equal to approximately one-third the width of antennal club. Anterior portion of ventrites 3, 4 and 5 scarcely modified, very narrowly glabrous and flattened across their entire width. Ventrite 5 flattened, slightly convex apically, its surface with only one scale and rather sparsely clothed with fine hairs of moderate length. Ventrite 5 as wide basally as long, the sides converging to apex which is broadly truncate and feebly emarginate.

Aedeagus (Fig. 74) about five-sixths as long as entire abdomen. Aedeagus very slender, as wide as or slightly wider than thickest part of scape; in profile arcuate, the basal two-fifths more strongly so; apical opening in profile approximately a 45° angle, in dorsal view elongate oval.

Type series. - Holotype, male, Constanza, Dominican Republic, August 1938, 3-4000 feet, Darlington (MCZ). Paratypes, 4 males: same data as holotype (MCZ, Howden).

Discussion. - The paratypes vary in length from 2.4 to 2.6 mm. and in width from 0.8 to 1.0 mm. Two paratypes are colored as the holotype; the white humeral spot and white sutural interval are constant and characteristic

of the series. The beak appears to be subject to a moderate amount of variation; it is usually wider over the scrobes than between the eyes, but in one specimen is not. In two paratypes the beak is less concave than in the holotype; in one paratype it is more concave. The apex of the beak, i. e., apicad of the insertion of the antennae, varies from slightly to strongly deflected. In all the paratypes the epistoma is wider than in the holotype; one paratype has several scales encroaching upon the epistoma as in the holotype. The usual number of tibial teeth is four, but there may be up to six teeth.

When females of this species are found, they may have some development of the humeral angles, much broader elytra, and the elytra may be longer in proportion to the length of the prothorax; at least these are the female modifications exhibited in other flightless Tanymecini such as Pandeleiteius dentipes and Isodacrys spp. There may also be a slight swelling at the summit of the declivity, and the elytral striae may be even more confused.

This is the only flightless tanymecine known from the West Indies, the wingless condition in this case being considered of specific rather than generic rank (see discussion following generic description and in the Introduction). From other species of Paululus, constanzae may also be distinguished by its elongate-oval apex of aedeagus and poorly defined elytral striae with erect setae.

Paradacrys, new genus

Size small. Body and legs covered with scales and small setae. Beak short, subcubical, its dorsum a little narrowed; apical emargination triangular, very poorly defined; interantennal line not marked. Scrobe deep, approximately right-angled; the vertical portion a little closer to eye than to apex of beak, ending before ventral surface. Antenna short, sparsely clothed with very fine hairs and no scales; scape reaching beyond middle of eye; funicle seven-segmented, first segment elongate, remaining segments subequal, each approximately one-half the length of the first and slightly moniliform; club short to moderate. Eye small, not close to dorsal surface. Prothorax nearly as wide as long, basal and apical constrictions weak. Pronotum produced anteriorly over head, much longer than prosternum; apical margin of prothorax without ocular vibrissae, teeth or lobes. Elytra with humeral angles well-developed; 10 complete, punctate striae, though stria 10 poorly marked apicad of hind coxae. Legs short, fore leg only very slightly longer in both sexes. Fore femur less tapered basally than other femora but scarcely swollen, without teeth or serrations on inner edge; fore tibia dentate. Fore coxae usually separated by a width equal to or greater than antennal club. Hind tibia with corbel open. Tarsi completely padded; tarsal claws free. Abdomen with the anterior portion of ventrites 3, 4 and 5 slightly modified: a slight depression entire width of ventrite, but glabrous medially only. Aedeagus slender, as long as first three and one-half to four and one-half ventrites measured medially.

Type-species. - Paradacrys spatulatum, new species.

The name Paradacrys is intended to mean "alongside Isodacrys" and is neuter.

Discussion. - Paradacrys is most closely related to Paululus but it also shows an affinity with Isodacrys and to a lesser extent with Isodrusus and Pandeleiteinus. Paradacrys is endemic to the Bahama Islands, so it is not surprising to find its closest relative, Paululus, endemic to Hispaniola. The shorter, stouter aedeagus of Paradacrys, its eyes more distant from the dorsal surface, and its much more widely separated fore coxae are considered to

be of generic rank and are the principal basis for separating Paradacrys from Paululus.

A caricature of Paradacrys might be: an Isodacrys with well-developed humeri. Less conspicuous distinctions from Isodacrys are: fore coxae a little more widely separated than is usual for Isodacrys (except I. mexicanum Sharp), ventrites with weaker modification, aedeagus more slender, scape and funicle not squamose. Isodacrys is known only from the continental Neotropics (Map 1).

Paradacrys differs from Isodrusus in its free tarsal claws, larger beak and consequently more-oblique scrobe, and much simpler ventrites. I. insul-anus Howden also occurs in the Bahama Islands.

Paradacrys might also be confused with Pandeleiteinus though Pandeleiteinus is not known to occur in the West Indies. Pandeleiteinus differs principally in its contiguous or very narrowly-separated fore coxae, its much broader beak which is deeply, triangularly excised on the sides, and, usually, its ocular vibrissae.

The lack of ocular vibrissae in Paradacrys is not emphasized because of the special situation existing in the West Indies (see Introduction). However, it is interesting that both species of Paradacrys have a brief row of three or four very slightly elongated scales (Figs. 30, 34) on the anterior edge of the pronotum where ocular vibrissae would occur.

The articulating surface of all tibiae is small and squamose in both species; however, this may be the consequence of two closely related species rather than a generic character. The suture separating ventrites 1 and 2 is obsolete on its median third in both species of Paradacrys; this character may be of generic rank.

Key to the Species of Paradacrys

1. Elytral setae short, spatulate, i. e., broad and convex at apex.
Scales of elytra small, not contiguous. Aedeagus straight, as long as first three and one-half ventrites measured medially.
. 1. spatulatum, new species (p. 41)
- Elytral setae longer, ensiform, i. e., narrow, tapered from base. Elytra with white scales, at least, imbricate. Aedeagus slightly arcuate, longer than first four ventrites measured medially.
. 2. ensiformis, new species (p. 43)

(1) Paradacrys spatulatum new species

Figures 31, 34, 35, 46, 55, 73

Diagnosis. - Elytra gently, nearly evenly arcuate from base to apex. Scales of dorsum small, not contiguous. Elytral setae short, much broader at apex than at base.

Description. - Holotype, male, length 2.4 mm., width 1.0 mm. Specimen in poor condition with both antennae mounted separately. Color white and pale brown, marked as follows. Ventrums and sides of entire body white; an indistinct, median, white vitta on pronotum; elytra indistinctly marked, the white of the epipleurae extending in an arc onto dorsum from humeri to stria 3 at about middle, thence receding to stria 4, continuing posteriorly to declivity, thence across to suture. Scales of dorsal surface (Fig. 46) small, mostly not

contiguous, weakly margined and alutaceous. Setae of dorsum (Fig. 46 a, b) shorter than one scale, spatulate, i. e., broader and convex at apex, erect, feebly arched, uniserial on elytral intervals. Setae more numerous on beak and becoming longer towards apex of beak. Setae of legs and ventrum longer and more numerous.

Head and beak in profile flattened from apex to beyond middle of eyes, thence gently arcuate to pronotum. Beak (Fig. 31) short, subcubical, sides slightly convergent towards apex. Dorsal surface of beak with a shallow concavity delimited laterally by a faint, obliquely directed ridge extending from over insertion of antenna to frons; median line deeply impressed on frons; no interantennal modification. Apex of beak with triangular emargination marked by a very weak carina and occupying approximately one-half the width of beak. Epistoma with its anterior edge produced slightly beyond the apex of beak and reflexed except for small median indentation which is depressed. Scrobe obtusely angled, the horizontal portion shorter and more deeply impressed than the vertical portion which is slightly curved posteriorly, ending beneath eye before the ventral surface; vertical portion partly squamose and much closer to eye than to apex of beak. Antenna short, sparsely clothed with fine hairs. Scape feebly bowed to fit contour of beak; antennal club short, elliptical, compact. Eye moderate in size, moderately convex.

Prothorax as long as wide, sides feebly protruding, subparallel between weak basal and apical constrictions; disc flattened. Pronotum 2.0 times longer than prosternum. Punctures of prothorax obsolete. Anterior margin of prothorax with no trace of ocular vibrissae; some elongation of scales here but some scales abraded.

Elytra 2.3 times longer than prothorax; elytra across humeri 1.6 times wider than prothorax. Elytra with sides subparallel, slightly wider at middle. Base of elytra slightly arcuately emarginate between fifth striae. Elytra in profile (Fig. 34) gently, nearly evenly arcuate from base to apex, declivity only very slightly developed. Strial punctures not very deep and nearly concealed by the vestiture; not precisely aligned throughout; separated in the striae by one scale. Intervals even and flat, as wide as two to three scales.

Legs short. Fore leg (Fig. 55) scarcely enlarged, only the tibia longer than that of other legs; fore femur thicker throughout than other femora, but only slightly thicker medially than at ends; inner edge of fore tibia with four small teeth and a few minute serrations. Articular surface of tibiae small and clothed with a few scales.

Fore coxae separated by a distance almost equal to the width of the antennal club. Abdomen with suture separating ventrites 1 and 2 obsolete on median third. Anterior portion of ventrites 3 and 4 scarcely modified; anterior portion of ventrite 5 with median half slightly transversely sulcate. Posterior margins of ventrites 2, 3 and 4 convex; squamose posterior edge of ventrite 2 touching the succeeding segment throughout, but ventrites 3 and 4 separated medially from their succeeding ventrites by an abrupt, perpendicular, glabrous, plane surface, the base of which is slightly anteriorly directed. Ventrite 5 convex, its apex broadly truncate.

Aedeagus (Fig. 73) nearly straight, only basal fourth deflected; slightly thinner than antennal club; aedeagus as long as length of first three and one-half ventrites measured medially; apical opening approximately a 45° angle; apex in dorsal view scarcely attenuate, truncate.

Allotype, female, length 2.8 mm., width 1.3 mm. Color and pattern of holotype, but form more robust, head and beak stouter, antennal club wider. Differs from holotype in the following respects. Sculpture of scales a little

more pronounced. Dorsal surface of beak much flatter, median impressed line obsolete on frons, obsolete oblique ridges even weaker than in holotype. Anterior margin of prothorax at the usual site of ocular vibrissae with a row of white scales like those of the sides but elongated anteriorly over the margin. Elytra 2.6 times longer than prothorax; elytra across humeri 1.4 times wider than prothorax. Elytra with sides subparallel for about basal fifth before diverging to middle, thence gradually converging, scarcely rounded to apex. Fore coxae separated by a distance very slightly greater than width of antennal club. Abdomen (Fig. 35) with ventrites 2, 3 and 4 with posterior margins scarcely convex, separated from succeeding ventrites almost to sides by an abrupt, glabrous, plane surface. Anterior portion of ventrites 3, 4 and 5 narrowly glabrous and slightly depressed for approximately median two-thirds. Ventrite 5 slightly convex, its apex broadly rounded.

Type series. - Holotype, male, Grand Turk, Turks and Caicos Islands, B.W.I., June 1957, T. H. Farr (CNC). Allotype, female, same data as holotype (Inst. Jam.). Paratypes, 3 females. BAHAMA ISLANDS: 3 females, Green Cay (Great Bahama Bank), 18-19 March 1965, B. D. Valentine, R. W. Hamilton Collectors (AMNH, Valentine, Howden).

Discussion. - The three paratypes vary little from the holotype and allotype, especially in view of the relatively great distance between Grand Turk and Green Cay. The paratypes range in length from 3.0 to 3.4 mm. and in width from 1.3 to 1.5 mm. In color, they vary from whiter and less maculate than the holotype to much more vividly marked. In the latter, the white elytral markings are bordered with brown and the disc between the markings is mottled. White scales tend to be closer to each other than dark scales, but even the white scales (with rare exceptions) are distinctly separated on the dorsal surface. The dorsum of the beak may be slightly less concave and in one paratype the frons is much more abruptly transversely swollen. In two paratypes the elytra are more broadly rounded in dorsal view, the profile is less arcuate, though not as flat as in *ensiformis*, and the alternate intervals are slightly raised, with more numerous setae, and distinctly wider, often being as wide as six scales. The sutural interval is more elevated for its basal half than in the holotype or allotype, thus contributing to the arcuate elytral profile.

Paradacrys spatulatum is easily distinguished by its characteristic elytral setae which are shorter than the surrounding scales, curved and much broader at the apex than the base; its elytral scales which are very small and not contiguous; its elytral profile which is evenly arcuate from the base; and its aedeagus which is straight except at the extreme base.

2. *Paradacrys ensiformis*, new species

Figures 30, 37, 45, 71.

Diagnosis. - White scales of elytra imbricate, setae of elytra ensiform.

Description. - Holotype, male, length 2.4 mm., width 1.0 mm. Color white, brown and tan, marked as follows. Head slightly mottled, disc of prothorax indistinctly marked with three tan vittae. Elytra with epipleurae and sides of disc white, slightly mottled with tan, the white area reaching stria 6 for basal third, then abruptly swelling in a large lobe to stria 4 at middle of elytra, receding again to stria 6, then extending diagonally with several interruptions to summit of declivity; much of the white area bordered anteriorly with brown; interval 4 brown on basal fourth, remainder of disc mottled tan. Legs predominantly white; ventrum white. Scales of head and pronotum angular,

not or almost contiguous, very finely margined, very finely granular. Colored scales of elytra (Fig. 45a) seldom angular, usually partly or completely rounded, contiguous or nearly so, very finely margined, very finely granular, often with an obsolete central pustule, becoming more strongly sculptured towards declivity; most white scales of elytra imbricate. Setae of head and pronotum as long as one to one and one-half scales, very slender, nearly prostrate, slightly arched, numerous on frons; setae on apex of pronotum much longer, darker. Setae of elytra (Fig. 45a, b) semi-erect, i. e., base of seta arcuate, remaining half or two-thirds straight, oblique or parallel to surface, ensiform, i. e., long, narrow, tapered from base. Setae of legs and ventrum like those of elytra but longer, more conspicuous, more numerous, white.

In profile, beak nearly flat; gradually, slightly deflected apicad of insertion of antennae; head gently arcuate from posterior edge of eye to pronotum. Dorsum of beak 0.9 times as wide as head between eyes, edges straight. Base of beak with a small, shallow concavity; interantennal line unmarked; scales of beak gradually becoming more convex, rounded, shinier towards apex, only slightly sparser; setae of beak straight, erect. Apical emargination poorly defined, approximately right-angled, its posterior edge not carinate, vibrissae on sides of emargination indistinguishable from long setae. Median line finely indented on frons to middle of eyes. In dorsal view, head appears unusually tapered from base to apex, the posterior edges of the eyes therefore much more widely separated than the anterior edges. Scrobe slightly obtusely angled, approximately the same width throughout, deep, horizontal portion three-fifths as long as vertical portion, slightly closer to eye than to apex, ending above ventral surface beneath anterior edge of eye. Scape feebly bowed to fit contour of beak. Antennal club elongate, elliptical, slightly loose. Eye moderate in size, moderately convex, slightly elliptical.

Prothorax 1.1 times longer than wide; constrictions obsolete on disc, basal constriction obsolete on sides in dorsal view; sides scarcely rounded between constrictions. Pronotum 2.0 times longer than prosternum. Punctures of prothorax obsolete. Anterior edge of pronotum with three consecutive, very slightly elongated scales at the site of ocular vibrissae.

Elytra 2.3 times longer than prothorax; elytra across humeri 1.3 times wider than prothorax. Base of elytra slightly arcuately emarginate. Elytra with sides parallel for basal fourth, feebly divergent to just beyond middle, thence gradually, broadly rounded to declivity, the apex broadly rounded, extending slightly beyond; apices briefly, slightly divergent along suture; individually rounded. In profile, elytra flattened on basal fourth, slightly arcuate, thence more strongly arcuate from basal third; summit of declivity scarcely perceptible. Strial punctures moderately small, regularly aligned. Intervals even, very slightly convex on disc.

Fore leg distinctly longer than other legs, fore femur proportionately not thicker than other femora; inner edge of fore tibia with four moderate teeth. Articular surface of tibiae densely, almost completely squamose.

Fore coxae separated by a distance equal to four-fifths the width of the antennal club. Abdomen (similar to Fig. 37) with suture separating ventrites 1 and 2 obsolete on median third. Ventrites 3, 4 and 5 with anterior portion glabrous and concave for approximately median three-fifths, the modification wider medially; edge of modification not abrupt, partly squamose. Posterior edge of ventrites 2, 3 and 4 abruptly perpendicular, glabrous opposite modification of anterior edge of succeeding segment. Ventrite 5 nearly flat, apex deflected, briefly truncate-emarginate.

Aedeagus (Fig. 71) slightly longer than first four ventrites measured

medially; slightly arcuate, basal fourth more abruptly so; thickened before apical opening which is oval with apex attenuate. Aedeagus thicker than antennal scape, but thinner than antennal club.

Allotype, female, length 3.1 mm., width 1.3 mm. A fine, fresh specimen with mandibular cusps still attached (Fig. 30). Differs from holotype in the following respects. Color pattern as in holotype but thoracic markings less distinct on disc and elytra darker on disc. More elytral scales imbricate than in holotype. Head and beak more robust; eyes less convex, scarcely exceeding sides of beak in anterior view. Median line impressed for distance of only one scale. Scrobe with horizontal portion three-fourths as long as vertical portion; antennal club slightly shorter, broader than that of holotype. Elytra 2.4 times longer than prothorax; elytra across humeri 1.4 times wider than prothorax. Elytra with sides more gradually converging from middle, apex narrower, longer; in profile, declivity more oblique. Alternate intervals very slightly wider, intervals across middle of elytra as wide as three to five scales. Fore coxae separated by distance approximately equal to width of antennal club. Modification of anterior portion of ventrites 3 and 4 similar to holotype; modification of ventrite 5 (Fig. 37) much broader, approximately rectangular, occupying approximately median half of ventrite. Ventrite 5 elongate, very narrowly rounded.

Type series. - Holotype, male, 5 miles E. lighthouse, S. shore, Castle Is., Bahama Islands, B.W.I., 4 April 1965, B. D. Valentine, R. W. Hamilton Collectors (AMNH, temporarily Valentine). Allotype, female, same data as holotype (AMNH, temporarily Valentine). No paratypes.

Discussion. - Paradacrys ensiformis may always be distinguished from P. spatulatum by any of the following characters: aedeagus long, arcuate; many scales of elytra imbricate; setae long, slender, semi-erect. The less evenly arcuate elytral profile is also distinctive but more difficult to assess.

The type locality of P. ensiformis is nearly in the middle of the rather large range of P. spatulatum.

Pandeleteius Schönherr

Pandeleteius is a very large New World genus but is represented in the West Indies by only two species: the endemic Pandeleteius testaceipes Hustache and the introduced Pandeleteius nodifer Champion.

In this genus the anterior portion of ventrites 3, 4 and 5 (Fig. 44c) is flat and unmodified (rarely arcuately depressed and partly glabrous) though the posterior portion may be modified; the fore legs are usually conspicuously enlarged; and the ocular vibrissae are well-developed.

Key to the West Indian Species of Pandeleteius

1. Immaculate or predominantly white. Elytra with base of intervals 3, 4 and 5 conjointly produced anteriorly. . . . 1. nodifer Champion (p. 46)
- Maculate brown. Base of elytra unmodified. 2. testaceipes Hustache (p. 48)

1. Pandeleteius nodifer Champion

Figures 44c, 76.

Pandeleteius nodifer Champion, 1911, p. 206. Lectotype, here designated, female, labelled, "Lago Managua, Nicaragua, 7.II. Solari", "Type" on a circle of paper with an orange border, "♀", "Sp. figured", and "vibr. wanting" (BM).

Diagnosis. - Elytra with base of intervals 3, 4 and 5 conjointly produced anteriorly.

Description*. - Males vary in length from 4.3 to 5.2 mm., and in width from 1.3 to 1.7 mm. Females vary in length from 4.4 to 5.6 mm. and in width from 1.6 to 2.1 mm. Clothed with white, marked with a pale brown, broad, median thoracic vitta and infrequently with scattered spots on elytra. Scales mostly not contiguous, finely granular, not margined. Setae minute.

Beak flat or feebly concave at base, long; sides parallel, vertical. Median line impressed from about middle of eyes to interantennal line (which is unmarked), from thence median line finely glabrous, carinate to apical emargination. Apical emargination acutely angled, as long as wide, finely carinate, occupying less than one-half the width of beak. Epistoma slightly concave, anterior edge emarginate medially. Scrobe gently arcuate, ending opposite middle to ventral edge of eye. Eye very large, flattened; scarcely more convex than head.

Prothorax averaging 1.2 times longer than wide in males and 1.1 times longer than wide in females. Prothorax widest at apical third (over fore coxae); constrictions absent or obsolete on sides. Disc flattened, depressed before base, leaving base higher than disc. Pronotum 1.1 times longer than prosternum. A cluster of an average of 12 vibrissae arising from a squamose tubercle, the vibrissae often reaching eye.

Elytra of males average 2.3 times longer than prothorax, elytra of females average 2.6 times longer than prothorax; elytra across humeri 1.25 times wider than prothorax in both sexes. Males with sides of elytra nearly parallel to middle, thence converging to apex, scarcely constricted beneath terminus of intervals 4 to 6; in profile, disc flat, declivity oblique to nearly vertical; summit of declivity rounded. Females with sides of elytra rounded, divergent beyond basal fifth or sixth, convergent from about middle; apical terminus of intervals 4 to 6 somewhat more conspicuous in dorsal outline; in profile, disc slightly arcuate beyond basal fifth or sixth, sutural interval at summit of declivity produced posteriorly in a knob, declivity arcuate or straight, slightly oblique. Base of elytra with intervals 3, 4 and 5 conjointly arcuately produced anteriorly and upward. Elytral striae closely set with small punctures; striae not always perfectly straight; striae 1, 2 and 3 in particular prone to irregularities on declivity. Intervals becoming convex towards sides and base.

Fore leg long; fore femur greatly but gradually swollen; fore tibia slender, with five to seven small teeth on inner edge.

Fore coxae of male extremely narrowly separated, i.e., by less than narrowest width of scape; fore coxae of female more widely separated but still usually less than greatest width of scape. Ventricle 5 of male nearly flat, apex

* This description, except for measurements, is based on the Jamaica population; comparison of non-West Indian populations is found under "Discussion".

truncate to emarginate.

Aedeagus (Fig. 76) evenly, rather strongly arcuate; dorsum depressed from apical third to orifice which is at apical sixth; apex turned up. Ventrite 5 of females with slight depression on either side at base; apex narrowly rounded.

Type material. - Paralectotype, hereby designated, male, labelled "Colombia" (BM).

The lectotype is 4.6 mm. long, 1.7 mm. wide. It is teneral, and missing the last three tarsal segments on the left fore leg as well as a few scales of dorsal surface. The color in the illustration is accurate. The lectotype differs from the description in the following respects: the prothorax instead of being "as long as broad" is actually much longer than broad, i. e., 3.1:2.8. Champion describes the vibrissae as "reduced to a few hairs"; actually they are abraded on the right side and on the left side consist of a fully-developed cluster.

Distribution. - Colombia (BM, MCZ), Nicaragua (BM), Honduras (Howden, Hubbell, USNM), Jamaica (Inst. Jam., Ill.), and Miami, Florida (Fla. Plant Board, Howden, Kissinger, USNM). Total number of specimens examined: 32. JAMAICA: 4 males, 8 females, Port Henderson Hill, St. Catherine, 25 June 1958, M. W. Sanderson or T. H. Farr, on Cassia emarginata (Inst. Jam., Ill.).

Discussion. - In addition to the population on Jamaica, a colony of P. nodifer now exists around Miami, Florida. The Miami specimens differ as follows: scales often much more closely spaced and in a few specimens are even imbricate; thoracic vitta pale gold, no specimens with elytral spots; up to ten teeth and many extra serrulations on inner edge of fore tibia.

Honduras specimens, as would be expected, conform most closely to the lectotype. Compared to the Jamaican specimens their scales are more coarsely granular, in some specimens being even subpustulate and submarginate, and elytral spots are much more frequent.

In one Colombian female the apex of the beak is less deflected, and in another the color pattern is much more elaborate: intervals 3 and 4 white, intervals 1 and 2 brown and remainder of disc of elytra mottled. Thus the most immaculate specimens occur in the northern part of the range (Florida) and the brown markings become more frequent and more numerous southward, being most fully developed in the southern extreme (Colombia).

There are at least nine species of white Pandeleteius on the continent; of these at least two - amulae Champion and albisquamis Champion - have some development of the base of the elytra. Both of these species differ from nodifer in having the prothorax much shorter and the fore coxae widely separated. Pandeleteius nodifer is very close to longicollis Champion, another white species which has a large distribution, but in this case along the Gulf Coast of Mexico into Texas. Pandeleteius longicollis differs from nodifer in the lack of development of the base of the elytra and the orifice of the aedeagus situated at the basal two-fifths.

Biology. - A variety of hosts are recorded for the adults. Honduras specimens are recorded from leaves of Lantana camara L., carbonal, and from the "roadside". The Jamaican specimens were taken on Cassia emarginata. The Florida specimens were taken on "bush" and "feeding on the leaves of Pithecolobium dulce Benth."

2. Pandeleteius testaceipes Hustache

Figures 36, 75

Pandeleteius testaceipes Hustache, 1929, pp. 181-182. Cotypes, Guadeloupe (Paris) (See discussion under "Type Material").

Diagnosis. - Posterior margin of epistoma parabolic, strongly and acutely keeled, extending half-way to interantennal line.

Description. - Males, length 2.5 to 3.1 mm., width 0.9 to 1.1 mm.; females, length 3.4 to 3.7 mm., width 1.3 to 1.4 mm. Color and markings as described by Hustache, but museum specimens brown rather than testaceous. Brown and pale brown with sides and ventrum pale or opalescent; disc of thorax with a pale vitta either side of median line, elytra sometimes with a broken white "V" at summit of declivity, disc of elytra usually mottled. Scales finely granular, not margined or with a margin which is usually composed of coalescent granules. Elytral setae very fine, inconspicuous, completely arched, uniserial on all intervals.

Beak rather elaborately sculptured; sides subparallel from base to apicad of scrobes, thence abruptly convergent. Dorsal surface of beak with lateral ridges extending obliquely towards median line, their termination at base of beak abrupt, often creating a transverse depression between eyes; interantennal line marked by a fine to moderate ridge; median line moderately to deeply impressed from interantennal ridge to frons; scales apicad of interantennal ridge usually submetallic. Epistoma extending approximately one-half of the distance from apex to interantennal line; posterior margin of epistoma parabolic in shape, strongly and acutely keeled, set with a row of three or four vibrissae; anterior edge of epistoma straight with a small median indentation. Scrobe deep, broad, the vertical and horizontal portions approximately equal and at right angles to each other, ending before ventral surface. Antenna with club usually approximately twice as long as wide, the segments of the club somewhat "loose". Eye moderate in size and convexity.

Prothorax usually as long as wide, but in males sometimes longer than wide and in females sometimes wider than long. Thorax with moderate basal and apical constrictions, sides rounded between constrictions, disc only feebly convex, median line unmarked except by a narrow dark vitta. Pronotum slightly produced anteriorly over head; in males pronotum averages 1.4 times longer than prosternum, in females pronotum averages 1.6 times longer than prosternum. A cluster of four or five ocular vibrissae arising from the unmodified margin of pronotum.

Males (Fig. 36) with elytra subcylindrical, 2.5 to 2.8 times longer than pronotum, sides parallel to about apical third, thence gently rounded to beneath termination of intervals 4 to 7, beyond which the apex is slightly attenuated. Females with elytra approximately diamond-shaped, 2.8 to 3.0 times longer than pronotum, sides divergent from humeri to just beyond middle, thence convergent to apex with scarcely any interruption in dorsal outline beneath termination of intervals 4 to 7; in profile, disc beyond basal fourth much more convex than in males. Elytral intervals equal, flat or nearly so. Striae set with small punctures, not very prominent.

Fore femur strongly, abruptly swollen; fore tibia slender, feebly bowed or straight, usually with six small teeth on inner edge. Tarsal claws free.

Distance between fore coxae of males equals approximately half the width of antennal club; between fore coxae of females equals the width or slightly more

than width of antennal club. Ventrite 5 of male long, slightly convex, with apex broadly rounded. Ventrite 5 of female triangular in shape with apex narrowly rounded, a shallow depression each side of median line at base.

Aedeagus (Fig. 75) straight with basal third or fourth and apex curved downward. In dorsal view apical opening broad, wider than shaft of aedeagus, elongate elliptical.

Type material. - The type series is listed by Hustache (1929, p. 182) as consisting of "15 specimens (Fl. 8; Mus. 7)"; only the "Fl. 8" have been located to date. In the introduction to his paper, Hustache relates that the publication of Fleutiaux and Sallé's list of Coleoptera of Guadeloupe (1889) was a great stimulus to collecting on Guadeloupe, G. Dufau in particular responding by collecting and sending to Paris approximately 9,500 Curculionidae for determination! Dufau sent three principal collections - the first to Fleutiaux, the second to the Museum, and later a third collection to Hustache. In the Paris Museum I searched unsuccessfully for P. testaceipes in the general collections and the Hustache collection. Mme. Bons later located the series of eight specimens in Box no. 1 of the Fleutiaux Collection. The series (except "the type") was very kindly loaned for study and there seems no reason to doubt that they are the "Fl. 8" of Hustache. However, I doubt that the remaining specimen is the type, since Vaurie (in litt.) reports that it does not bear a type label, whereas all the other Hustache species that I saw bear a white label with "TYPE" printed in red. This specimen is labelled in Hustache's handwriting. "Pandeleteius testaceipes mihi", and above this label is another, in the same writing "P. crassipes, n. sp."; it is from Trois Rivières, Guadeloupe, Dufau Collection. "P. crassipes" could well be a Dufau name which Hustache decided not to perpetuate.

A lectotype is not designated since the type could well be among the seven specimens that have not been located; there is no taxonomic confusion between this species and any others.

Distribution. - Lesser Antilles. Total number of specimens examined: 19. DOMINICA: 1 male, Gran Savanna Nr. Salisbury, 18 June 1964, H. Hespenheide, on Crotan sp. (Hespenheide). GRENADA: 1 male, Balthazar, Windward side, H. H. Smith, 1917-125, 38 (BM); 1 male, Windsor, H. H. Smith 25 (BM). GUADELOUPE: 1 female, Gourbeyre, Vitrac (Fleutiaux Coll., Paris, cotype); 3 males, 2 females, Pointe Noire, Route des Mamelles, 25 August 1965, J. Bonfils (AMNH, Howden); 3 males, Trois Rivières, Dufau, one with additional data of: au parap en forêt très rare, exemplaire foncé (Fleutiaux Coll., Paris, cotypes); 3 males, Vitrac (Fleutiaux Coll., Paris, cotypes). ST. VINCENT: 2 males, 2 females, H. H. Smith, 1917-125, one male with additional data: 3000 feet, Windward side (BM, Howden).

Discussion. - P. testaceipes is most closely related to Pandeleteius kirschi (Faust)* which occurs in Venezuela and Colombia. A series of ten specimens of kirschi, including the type, was examined and compared with testaceipes. Other than the differences in the range and in size (the mainland kirschi males average 0.3 mm. longer and the females 0.5 mm. longer), testaceipes can be separated from kirschi by the: aedeagus which is rather broadly rounded apically (in kirschi pointed and with a knob at apex), elytra slightly attenuate in female, epistomal keel extending about half way to inter-antennal line (in kirschi keel extends three-fourths of the distance to inter-antennal line), antennal club which is slightly shorter, broader and "looser", and less swollen fore femora.

* To be discussed in a future paper.

Of all the endemic West Indian Tanymericini, this is the only one which bears ocular vibrissae. They are only scarcely reduced from the luxuriant vibrissae of P. kirschi.

The three specimens of Pandeleiteius sublineatus Champion from St. Vincent and Grenada which Champion said, "seem to belong to this species" [sublineatus] (1911, p. 204) are actually P. testaceipes. These are also the specimens referred to sublineatus in Leng and Mutchler's list (1914, p. 468) of the Coleoptera of the West Indies.

Isodrusus Sharp

Isodrusus is represented in the West Indies by two endemic species, insulanus Howden in the Bahama Islands and guajavus n. sp. in Jamaica. The third species in the genus, debilis Sharp, occurs on the mainland from Guatemala to Texas (Map 3). The species are quite uniform in their very short beaks; strongly modified anterior portion of abdominal ventrites 3, 4 and 5; antennal scrobe strongly angled and deep to ventral surface of beak; and, of course, connate tarsal claws.

Key to the West Indian Species of Isodrusus

1. Fore tibia straight, with five to eight teeth on inner edge. Ocular vibrissae present (but vestigial). Dorsal surface of beak not constricted or narrowed at base. Bahama Islands. 1. insulanus Howden (p. 50)
- Fore tibia strongly bowed, without teeth on inner edge. Ocular vibrissae absent. Dorsal surface of beak constricted at base to one-half the width of the head between the eyes. Jamaica. 2. guajavus, new species (p. 50)

1. Isodrusus insulanus Howden

Isodrusus insulanus Howden, 1963, pp. 43-45. Type, Long Island (USNM).

Diagnosis. - As in key.

Discussion. - No additional specimens have been seen of this species since it was described from Long Island and Egg Island in the Bahama Islands. The aedeagus is similar to that of I. guajavus but it is more evenly arcuate and the apical opening is broader. The radial pattern of the elongate scales is quite distinctive. Length ranges from 2.5 to 3.7 mm., considerably larger than guajavus.

2. Isodrusus guajavus, new species

Figures 32, 33, 56, 69.

Diagnosis. - Fore tibia strongly bowed, without teeth on inner edge. Dorsum of beak greatly reduced in size at base by encroachment of scrobe.

Description. - Holotype, male, length 2.0 mm., width 0.8 mm. Color light green and bronze, marked as follows. Head and thorax mottled with sides mostly green; elytra with disc predominantly bronze, sides of elytra mostly green, the green protruding upon disc in a lobe to stria 4 at basal third and to stria 2 at apical third. Scales rounded or angular in shape, not arranged

radially around punctures, finely margined, reticulate to coarsely granular; green scales more finely sculptured and seldom margined; scales mostly not contiguous. Setae small, very inconspicuous, about as long as one scale, slender, completely arched.

In profile, head and beak obsoletely arcuate to posterior half of eyes, then feebly arcuate to pronotum. Beak short, cubical, three-fourths as long as head between eyes; sides vertical. Scrobes convergent towards base of beak, encroaching upon dorsal surface of beak and greatly reducing its size. Dorsum of beak at base 0.5 times as wide as head between eyes; dorsum at widest point, over insertion of antennae, 0.8 times as wide as head between eyes. Median line impressed from between insertion of antennae to middle of eyes; dorsum of beak longitudinally convex either side of median line to apicad of insertion of antennae, thence entire apex of beak abruptly, obliquely deflected. Apical emargination obliquely angled, its apex rounded, occupying approximately one-half the width of the beak; margin obsoletely carinate; epistoma with its anterior edge straight; with three vibrissae on each side. Scrobe acutely angled, shaped like a "7", vertical portion bowed towards apex of beak, deep and well-defined throughout, ending on ventral surface in front of anterior edge of eye. Scape bowed, much more strongly so basally. Antennal club moderate in size, base slightly elongate, cylindrical before expanding. Eye large, moderately convex, large-faceted.

Prothorax 1.2 times longer than wide; sides moderately rounded between relatively wide, equal basal and apical constrictions. Pronotum 2.0 times longer than prosternum; in profile, disc distinctly arcuate, constrictions distinct, the apical one longer. No trace of ocular vibrissae. Punctures small to moderate, deep.

Elytra 2.1 times longer than prothorax; elytra across humeri 1.3 times wider than prothorax. Base of elytra slightly emarginate. Elytra with sides parallel for basal seventh; slightly divergent from there to apical three-fifths, thence convergent, gently rounded to apex, the apical terminus of intervals 4 to 6 very slightly visible in dorsal outline. In profile, (Fig. 32) disc of elytra nearly flat, not deflected until beyond apical three-fifths; declivity straight, slightly oblique. Intervals even, flat. Striae set with moderate, deep punctures, becoming much smaller and shallower towards apex.

Fore leg (Fig. 56) with femur moderately, abruptly swollen. Fore tibia of even thickness; strongly, evenly bowed; with four minute denticles on inner edge.

Fore coxae separated by less than the greatest width of the antennal scape. Modification of anterior edge of ventrites 3, 4 and 5 almost straight, abrupt across entire width, higher medially, the edge not carinate. Ventrite 5 moderately convex, its apex narrowly truncate.

Aedeagus (Fig. 69) arcuate with apical half less so, slightly thicker than the apex of scape, as long as entire abdomen measured medially; apical opening in dorsal view elliptical.

Allotype, female, length 2.1 mm., width 0.8 mm. Differs from holotype as follows. Pronotum with a brown median vitta; elytral green markings bordered with brown. Head and beak more robust but dorsum of beak no larger and hence even more strongly constricted at base in relation to width of head between eyes. Prothorax 1.03 times longer than wide; pronotum 1.7 times longer than prosternum. Elytra 2.4 times longer than prothorax; elytra across humeri 1.3 times wider than prothorax. Elytra in dorsal view wider than in holotype at widest point, convergent sides less rounded to apex. Declivity

more abrupt, less oblique, obsoletely concave. Modification of anterior portion of ventrites (Fig. 33) 4 and (particularly) 5 arcuate, high medially, the edge subcarinate. Ventricle 5 slightly depressed behind anterior modification, otherwise slightly convex and scarcely distinguishable from that of male.

Type series. - Holotype, male, Moneague, St. Ann, Jamaica, 20 August 1966, A. T. Howden, on guava (Howden). Allotype, female, same data as holotype (Howden). Paratypes, 41 males, 40 females. JAMAICA: 37 males, 35 females, same data as holotype, A. T. or H. F. Howden collector (CNC, Howden); 2 males, Ewarton, St. Catherine Parish, 28 September 1945, E. L. Sleeper Collector (Sleeper); 2 males, 4 females, Newport [Manchester Parish], 18-19 February 1937, Chapin and Blackwelder (USNM); 1 female, Port Henderson, St. Catherine Parish, 28 September 1945, E. L. Sleeper Collector (Sleeper).

Discussion. - Males vary in length from 1.8 to 2.0 mm. and in width from 0.7 to 0.8 mm.; females vary in length from 1.9 to 2.2 mm. and in width from 0.7 to 0.9 mm. Variation in the type series is slight. The scales may be more or less sculptured than in the holotype. The green scales may be replaced in part or rarely entirely by white or tan and the bronze by light brown. The characters of the beak are particularly constant, though the dorsum may have the longitudinal convexities flatter than in the holotype.

The sexes are difficult to separate externally, the only reliable character being the anterior modification of ventrite 5 which is distinctly arcuate in the female and nearly straight in the male.

Isodrusus guajavus may always be distinguished from other Isodrusus by the conspicuously bowed, non-dentate fore tibiae and the greatly reduced dorsal surface of the base of the beak. Isodrusus guajavus is the smallest Isodrusus and the only one with green scales. The eye of guajavus is slightly smaller than that of insulanus, but much larger than that of debilis.

The series from Moneague was collected in a small, hilly pasture on young guava trees in fruit. It was not determined if the beetles were feeding on the fruit, leaves or stems; their small size and coloration thoroughly camouflaged them on the hairy trees.

The Ewarton and Port Henderson specimens collected by E. L. Sleeper were taken on a mesquite-like tree (Acacia?) called Huisache (in litt.).

FAUNAL LIST BY ISLANDS

Bahama Islands

Castle Island

Paradacrys ensiformis, new species

Egg Island

Isodrusus insulanus Howden

Grand Turk

Paradacrys spatulatum, new species

Green Cay

Paradacrys spatulatum, new species

Long Island

Isodrusus insulanus Howden

Rum Cay

Scalaventer convexifrons, new species

Greater Antilles

Cuba

Scalaventer cubensis, new speciesScalaventer subtropicus (Fall)

Grand Cayman

Scalaventer caymani, new species

Jamaica

Scalaventer cyrillae, new speciesScalaventer coccolobae, new speciesScalaventer litoreus, new speciesScalaventer montanus, new speciesScalaventer remotus, new speciesScalaventer jamaicensis, new speciesScalaventer valkyrius, new speciesIsodrusus guajavus, new speciesPandeleteius nodifer Champion

Hispaniola

Scalaventer gelinasus, new speciesPaululus calypso, new speciesPaululus hispaniolae, new speciesPaululus constanzae, new species

Lesser Antilles

Guadeloupe

Pandeleteius testaceipes Hustache

Dominica

Pandeleteius testaceipes Hustache

St. Vincent

Pandeleteius testaceipes Hustache

Grenada

Pandeleteius testaceipes Hustache

ZOOGEOGRAPHIC RELATIONSHIPS

A discussion of zoogeography can be only as sound as the extent to which the fauna is known, and there is still much to be learned of the West Indian Tanymecini. However, it seems there has been enough collecting by enough entomologists to consider the fauna of the islands proportionately represented and thereby indicate zoogeographic trends.

Here, as in the rest of the paper, the genera Pachnaeus and Polydacrys are not discussed; they are widespread in the West Indies.

In the West Indies there are five genera of Tanymecini of which two are truly endemic. By comparison, the total New World fauna is 16 genera (including several undescribed genera), all but one (Tanymecus) restricted to the New World. The relationships of the endemic genera to the mainland forms can only be surmised by morphological similarities.

Morphologically, the West Indian fauna is relatively unique among New World tanymecines in the modification of the anterior portion of the abdominal ventrites 3, 4 and 5. This modification is strong in Scalaventer and Isodrusus, reduced in Paululus and greatly reduced in Paradacrys; there is no modification in the fifth genus, Pandeleteius. The most extreme development is found in Scalaventer cyrillae, endemic to the high mountains of Jamaica. Other tanymecines having the anterior portion of the abdominal ventrites modified

are: Isodacrys, Pandeleteinus and the Pandeleteius subgenus Exmenetypus Voss. In this respect and others these taxa and the West Indian endemics are interrelated. Isodacrys ranges from southwestern United States to Guatemala; Pandeleteinus ranges from southwestern United States to Guerrero, Mexico; Exmenetypus ranges from Guatemala to Venezuela. See Maps 1, 2 and 3.

The island Tanymecini readily fall into two groupings, essentially following the classic pattern of a division between the Greater and Lesser Antilles.

In the Lesser Antilles the sole tanymecine representative is Pandeleteius testaceipes, which is endemic to Guadeloupe, Dominica, St. Vincent and Grenada. The species is closely related to Pandeleteius kirschi of Venezuela and Colombia, and one can easily postulate a South American origin for P. testaceipes.

The species occurring in the Greater Antilles and the Bahama Islands (see preceding Faunal List by Island) present a complex picture. The relatively rich Bahamian fauna consists of three genera, one of them endemic (Paradacrys). The two species of Paradacrys seem most closely related to Paululus, endemic to Hispaniola. The other two genera on the Bahamas, Scalaventer and Isodrusus, have relatives on the Greater Antilles and the mainland. The presence of one endemic genus, plus four endemic species, seems indicative of a relatively long separation of the Bahamian fauna.

The tanymecines on the remaining group of islands, Jamaica, Hispaniola, Cuba and Grand Cayman can be more easily related. Three genera occur in this area; two of them, Isodrusus and Scalaventer, are each represented on the mainland by a single species.

Only three species of Isodrusus are known. Isodrusus debilis, occurring from Texas to Guatemala, has well-developed vibrissae. Since the presence of ocular vibrissae is essentially a tribal character, the reduction or absence of vibrissae is significant, complete loss being considered indicative of long isolation. The Bahamian insulanus has vestigial vibrissae and the Jamaican guajavus has no vibrissae. This would indicate a longer isolation in Jamaica. A more specific interpretation based on the three species, other than considering that their distribution forms a relict pattern, is not feasible. In the case of Scalaventer, the mainland species, subtropicus, has an unusual distribution, occurring in Florida, Baja California and Cuba. Specimens from the two mainland localities have been carefully checked and seem identical. Since the two specimens known from Baja California are labelled merely "Santa Rosa, Low, Calif." with no other data, it seems inadvisable to place too much weight on the odd distribution. The Florida records represent numerous collections and a Cuba-Florida distribution is not unusual. The closest relatives of subtropicus are caymani and jamaicensis, and to a lesser degree the Bahamian convexifrons, the four species forming a distinct group. For this group the invasion pattern is assumed to stem from a center in Cuba or Florida. Two other very distinct groups, composed of five species, are endemic to Jamaica, which indicates a fairly long isolation and probably more than one invasion.

Hispaniola, while having only a single Scalaventer, has three species of the endemic genus Paululus. Again there is the inference of a relatively old, isolated fauna. This coincides with the findings in other groups.

There remains to be discussed Pandeleteius nodifer on Jamaica. I feel this is relatively recently established on Jamaica since it is widespread in Central America, is apparently confined to the Port Henderson area in Jamaica, is also recently established around Miami, Florida, and no other species of the large genus Pandeleteius occurs in the Greater Antilles.

Apparently, none of these tanymecines have reached Puerto Rico, or do

not now occur there. Extensive collecting in Puerto Rico during July, 1969, yielded no specimens pertinent to this study, none were found in any of the collections examined and there are no records in the literature. The Lesser Antillean fauna does not extend as far northward as Puerto Rico, and the Greater Antillean fauna veers northward and westward to the Caicos and Bahama Islands, not reaching Puerto Rico.

As far as is known none of the adult food plants in this study are endemic to the West Indies though most are native.

In summary, the tanymecine genera considered here probably represent early invasions of the islands, the Greater Antillean fauna either from Yucatan to Cuba, from Nicaragua-Honduras to Jamaica, or Florida to Cuba and thence through Hispaniola to Jamaica. The Bahamian genera may have derived from Floridian stock (especially Scalaventer and Isodrusus) as well as Greater Antillean stock (Paradacrys). The single Lesser Antillean species derived from Venezuelan stock. Why all of the genera mentioned are absent from Puerto Rico remains an interesting question.

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The lectotype of Pandeleteius nodifer was selected while studying at the British Museum in 1962 on Grant No. 438, Johnson Fund, American Philosophical Society.

Additional specimens of West Indian Tanymecini were borrowed from the following institutional and personal collections: American Museum of Natural History (AMNH), Patricia Vaurie; British Museum (Natural History) (BM), Richard Thompson; Canadian National Collection (CNC); Illinois Natural History Survey (Ill.), John Kingsolver and Milton Sanderson; Institute of Jamaica (Inst. Jam.); California State College at Long Beach (Long Beach); Museum of Comparative Zoology (MCZ), P. J. Darlington, Jr., and John Lawrence; Muséum National d'Histoire Naturelle (Paris), A. Descarpentries; United States National Museum (USNM), Rose Ella Warner; Henry A. Hespenheide; Elbert Sleeper; and Barry D. Valentine.

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A search for the type of Pandeleteius testaceipes Hustache involved M. Jacques Bonfils, Petit-Bourg, Guadeloupe; Mme. Bons, Muséum National de l'Histoire Naturelle, Paris; and Patricia Vaurie before it was located. M. Bonfils subsequently collected a series of topotypes and generously gave me examples.

LITERATURE CITED

- Champion, G. C.
1911. Otiiorhynchinae Alatae. In Biologia Centrali-Americana, Coleoptera, Vol. 4, pt. 3, pp. 178-354.
- Fall, H. C.
1907. Descriptions of new species. In Cockerell, T.D.A., and H. C. Fall. The Coleoptera of New Mexico. Trans. Amer. Ent. Soc. 33: 145-272.
- Fleutiaux, E., and A. Sallé.
1889. Liste des Coléoptères de la Guadeloupe et descriptions d'espèces nouvelles. Ann. Soc. Ent. France 9: 351-484.
- Howden, A. T.
1959. A Revision of the species of Pandeleteius Schönherr and Pandeleteinus Champion of America North of Mexico. Proc. Calif. Acad. Sci. (4) 29: 361-421.
- Howden, A. T.
1963. A new species of Isodrusus, with notes on Isodrusus debilis Sharp. Coleop. Bull. 17: 43-46.
- Hustache, A.
1929. Curculionides de la Guadeloupe, pt. 1. In Faune des Colonies Françaises, Tome III, fasc. 3, pp. 165-267.
- Leng, C. W., and A. J. Mutchler.
1914. A preliminary list of the Coleoptera of the West Indies as recorded to January 1, 1914. Bull. Amer. Mus. Nat. Hist. 33 (30): 391-493.



Figs. 1-5. Scalaventer feeding damage on leaves. 1, S. coccolobae feeding on Coccoloba tenuifolia; 2, S. montanus feeding on Clethra occidentalis; 3, S. cyrillae feeding on Cyrilla racemiflora; 4, S. litoreus feeding on Krugiodendron ferreum; 5, S. litoreus feeding on Haemotoxylum campechianum.

Figures 6-12. Scalaventer species.

Figs. 6, 8, 10, 11 lateral view: 6, cyrillae female; 8, coccolobae female from Mahogany Vale; 10, montanus male; 11, gelinasus female.

Fig. 7, dorsal view, cyrillae allotype, female.

Fig. 9, 12, anterior view of head: 9, gelinasus female; 12, valkyrius female.



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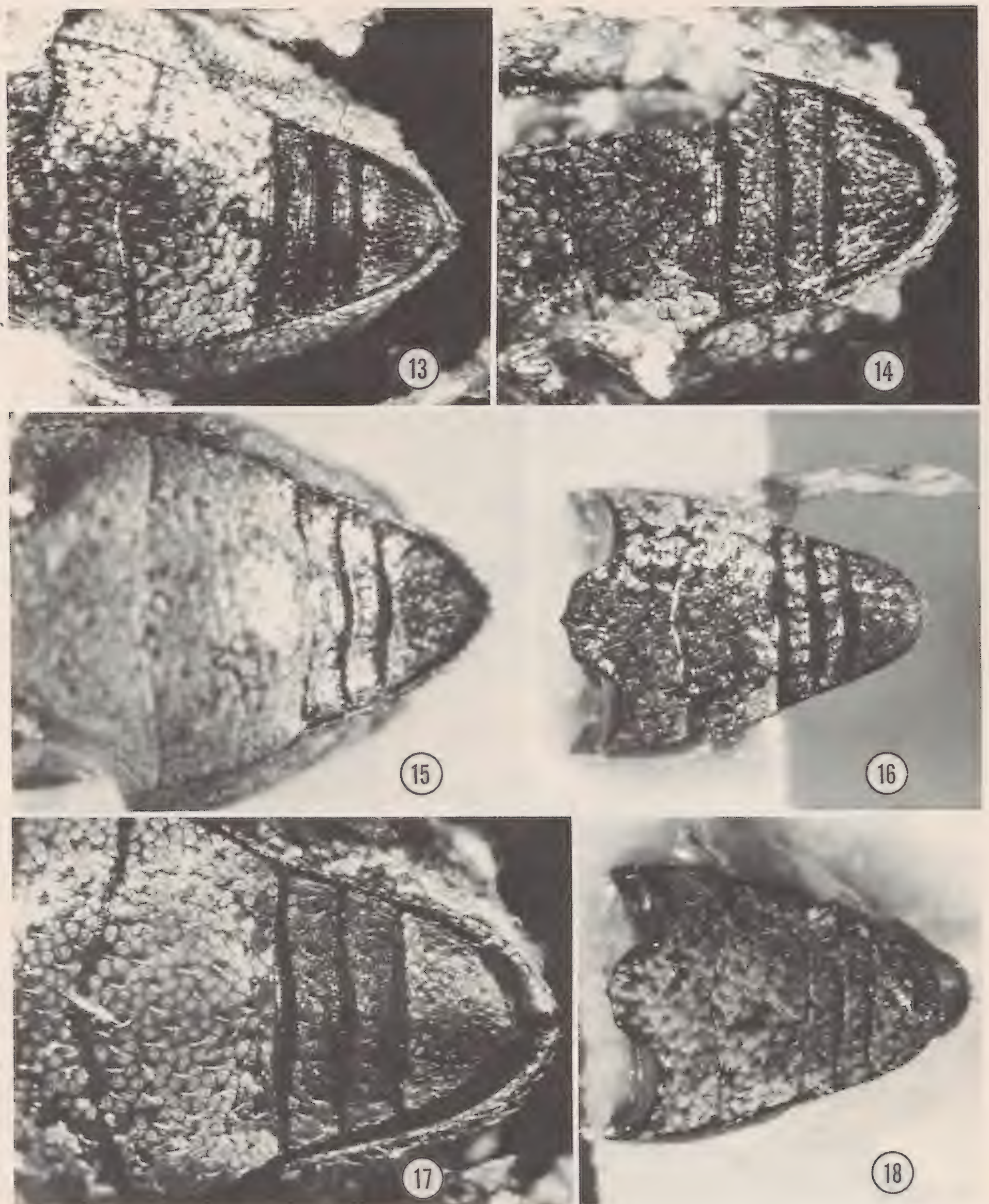
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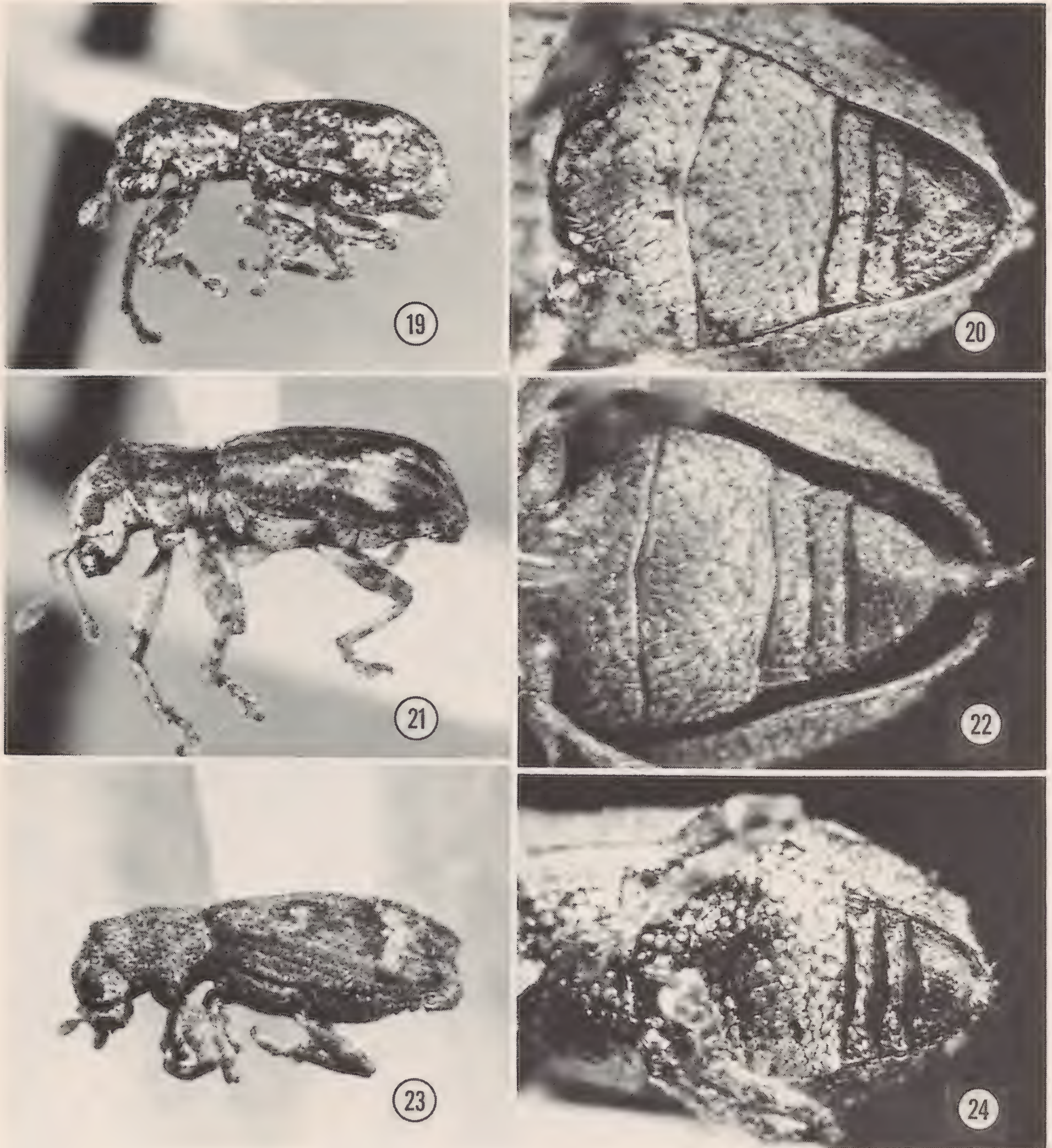
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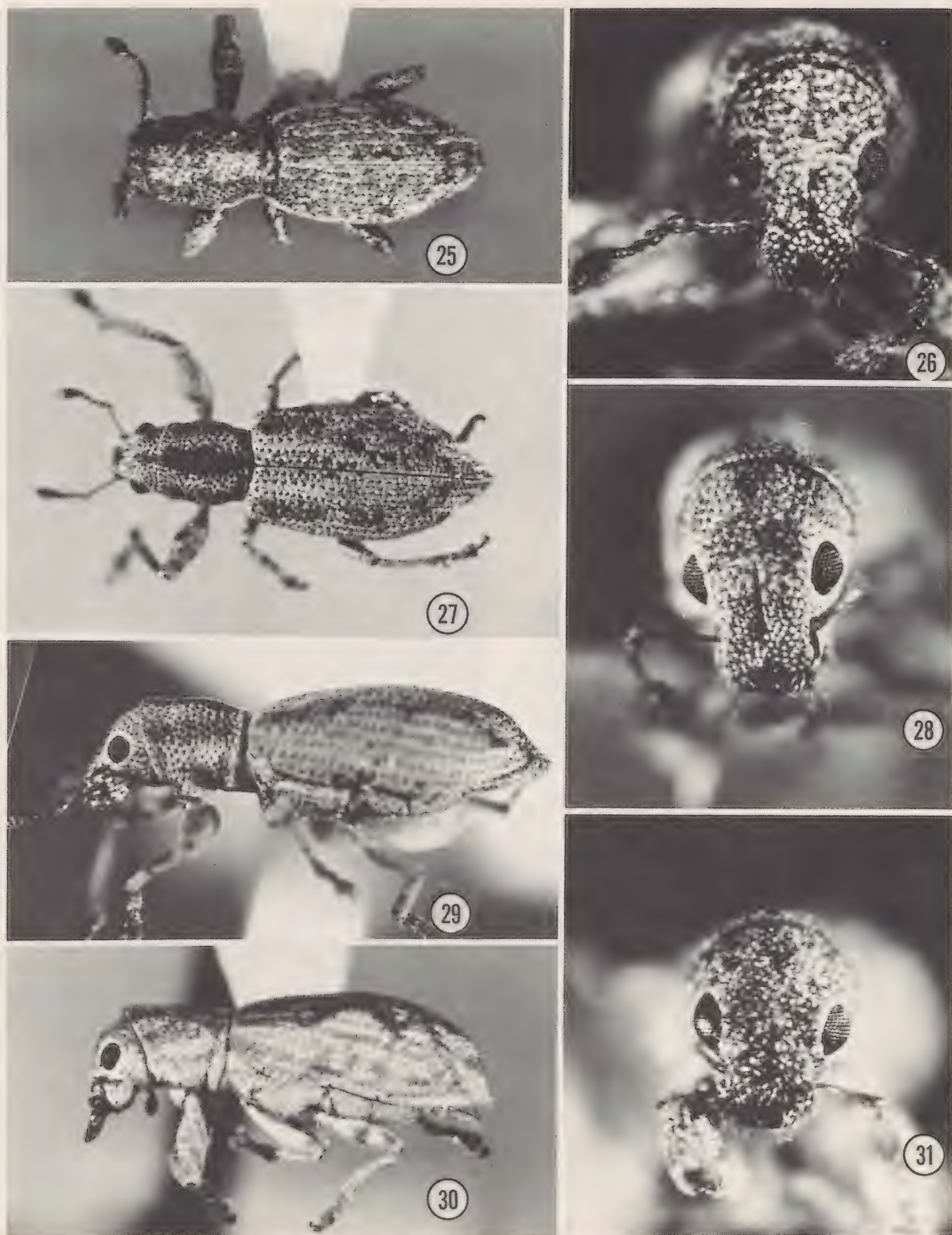
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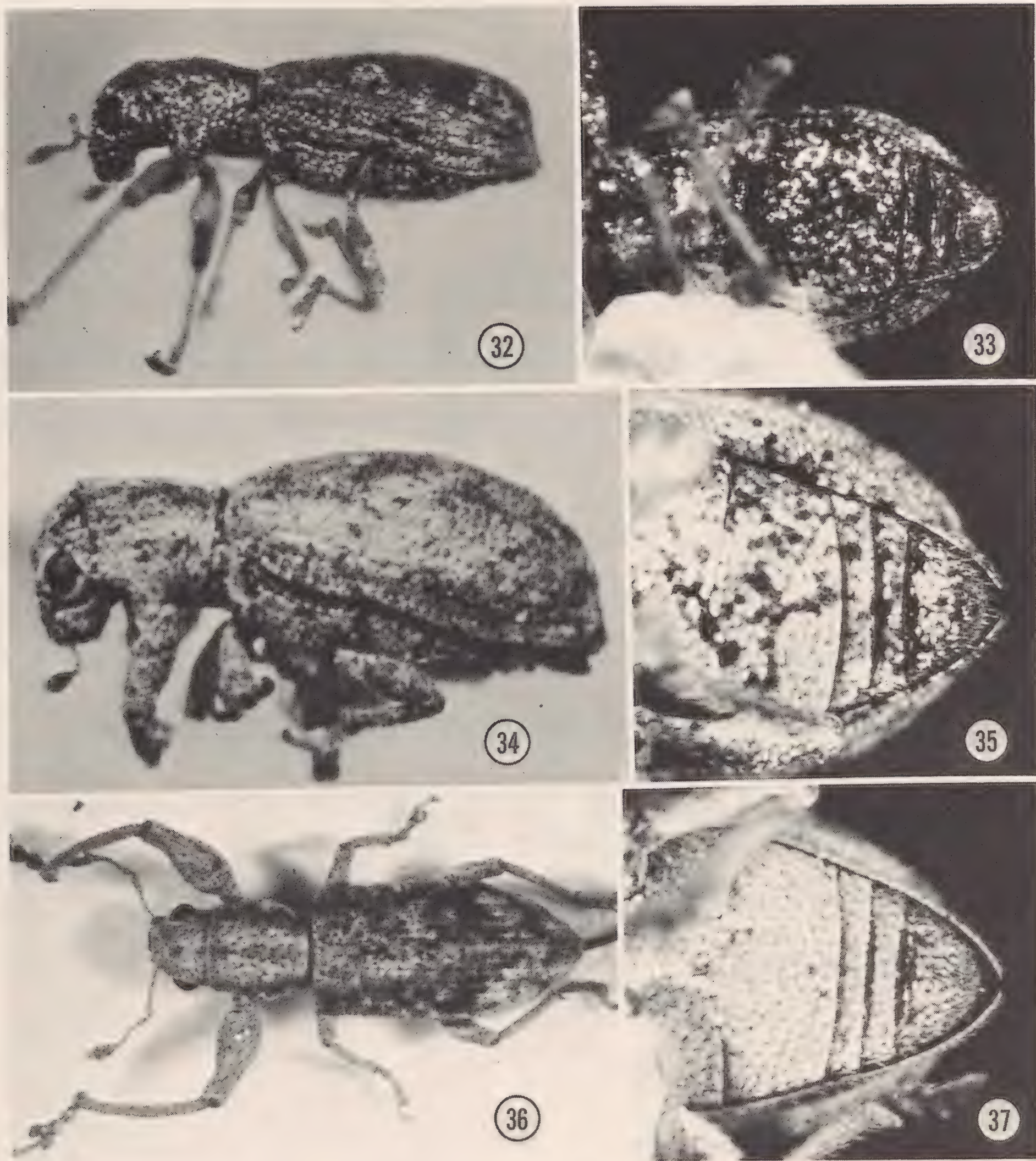
Figs. 13-18. Abdomen of Scalaventer species: 13, coccolobae female from Mahogany Vale; 14, litoreus female; 15, caymani holotype, female; 16, cyrillae male; 17, montanus allotype, female; 18, cubensis holotype, male.



Figs. 19-24. *Scalaventer* species. Figs. 19, 21, 23, lateral view of holotype: 19, *jamaicensis* male; 21, *convexifrons* male; 23, *valkyrius* female. Figs. 20, 22, 24, abdomen of holotype, female: 20, *remotus*; 22, *gelinasus*; 24, *valkyrius*.



Figs. 25-31. Figs. 25-29, Paululus species: 25, constanzae male, dorsal view; 26, constanzae, anterior view of head; 27, calypso female, dorsal view; 28, hispaniolae female from San José de las Matas, anterior view of head; 29, calypso female, lateral view. Figs. 30-31, Paradacrys species: 30, ensiformis allotype, female, from Castle Island, lateral view; 31, spatulatum allotype, female, anterior view of head.



Figs. 32-37. Figs. 32, 33, Isodrusus guajavus: 32, lateral view; 33, abdomen, female. Figs. 34, 35, Paradacrys spatulatum: 34, lateral view, allotype, female; 35, abdomen, female, from Green Cay. Fig. 36, Pandeleteius testaceipes male from Guadeloupe. Fig. 37, Paradacrys ensiformis, abdomen of allotype, female.

Figures 38-45.

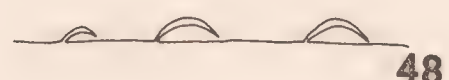
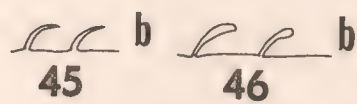
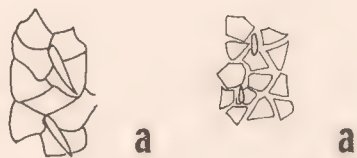
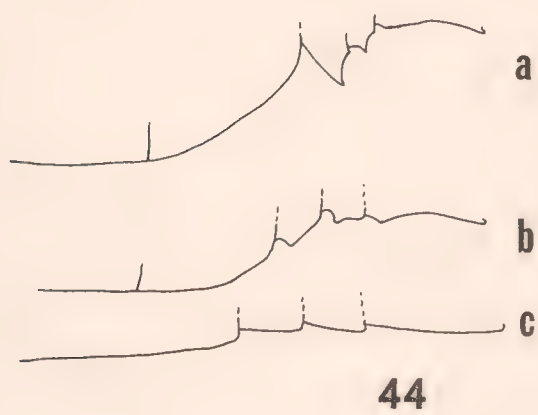
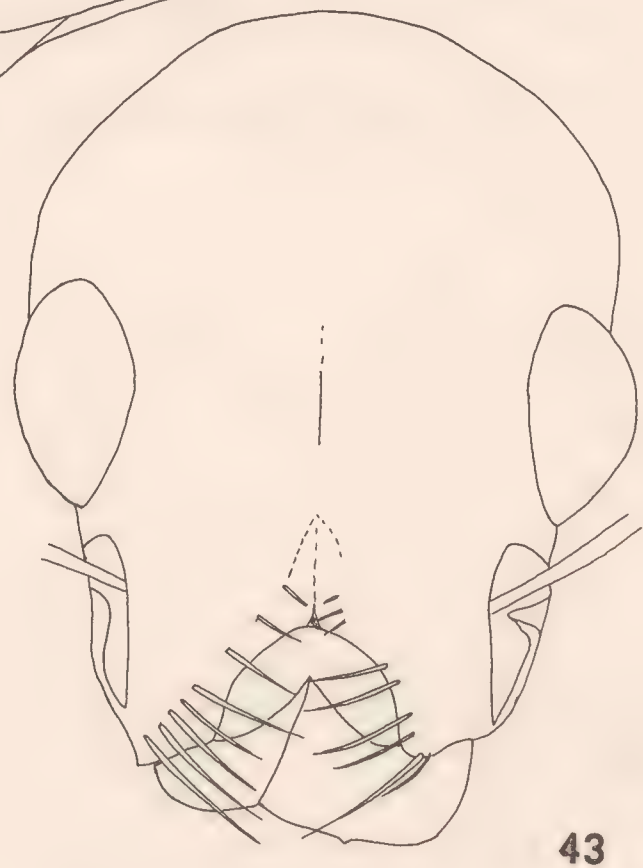
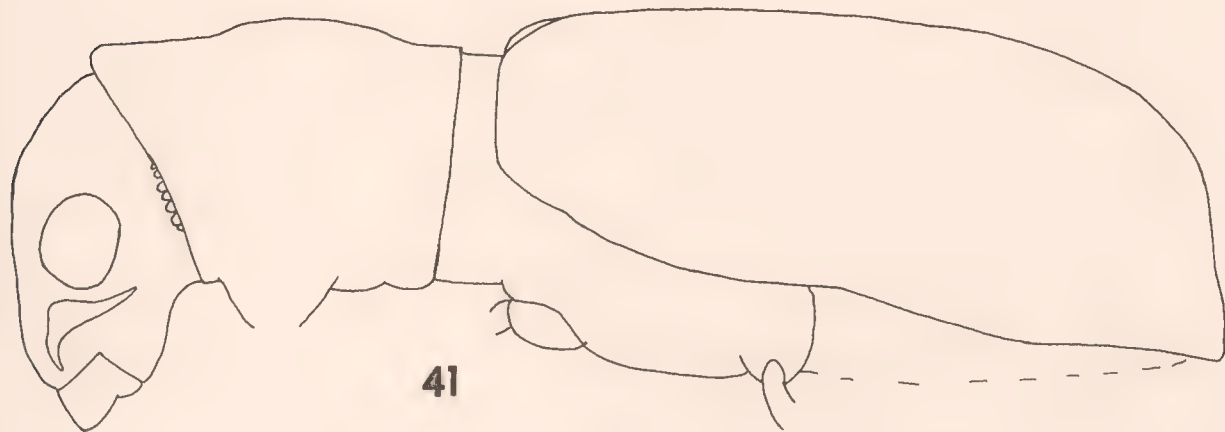
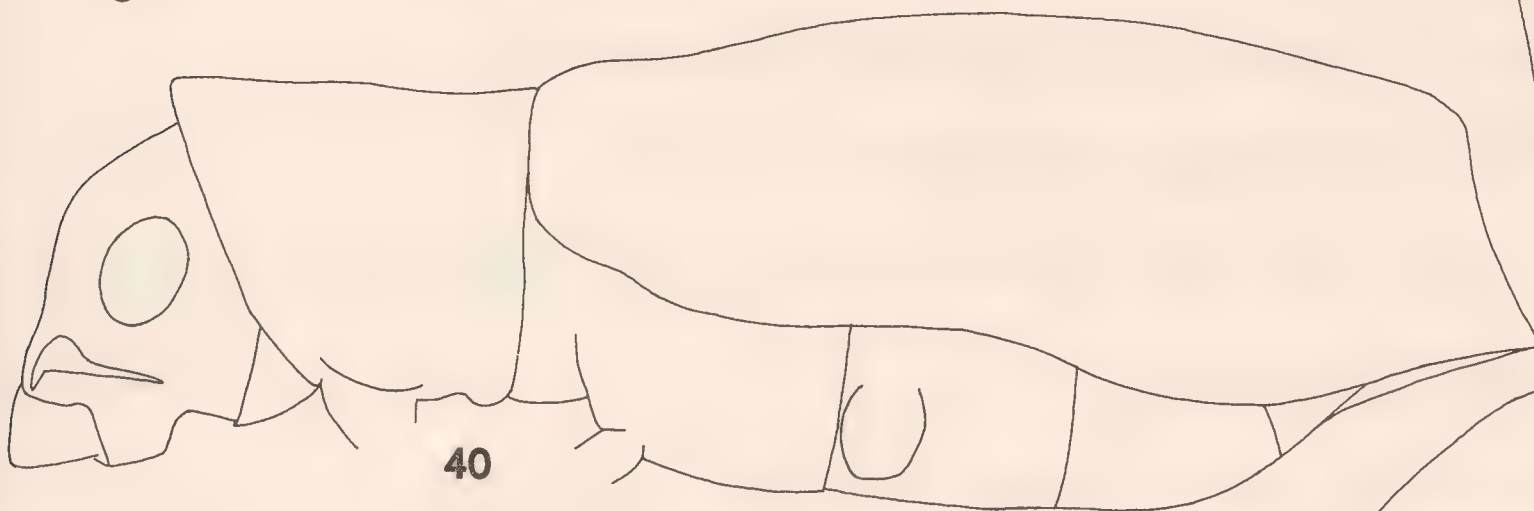
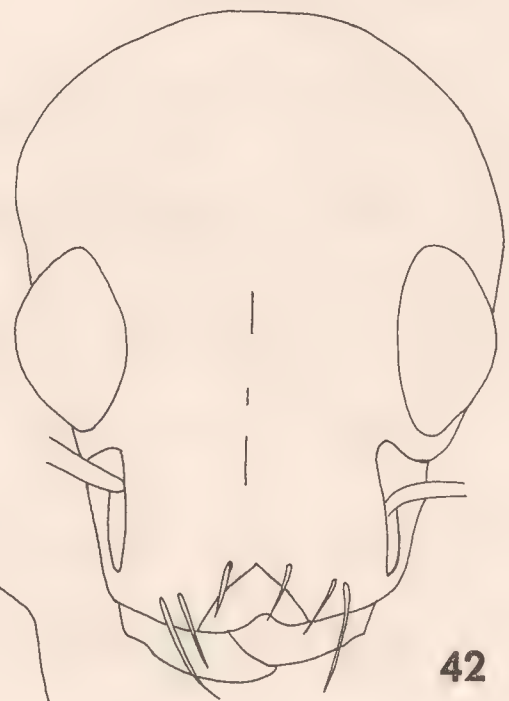
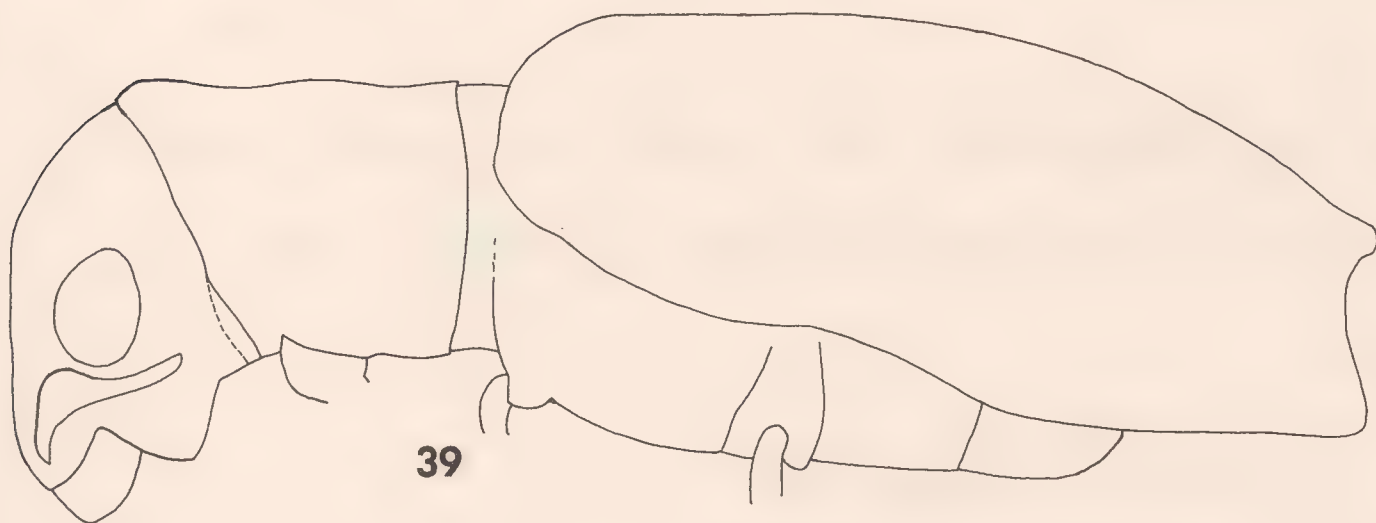
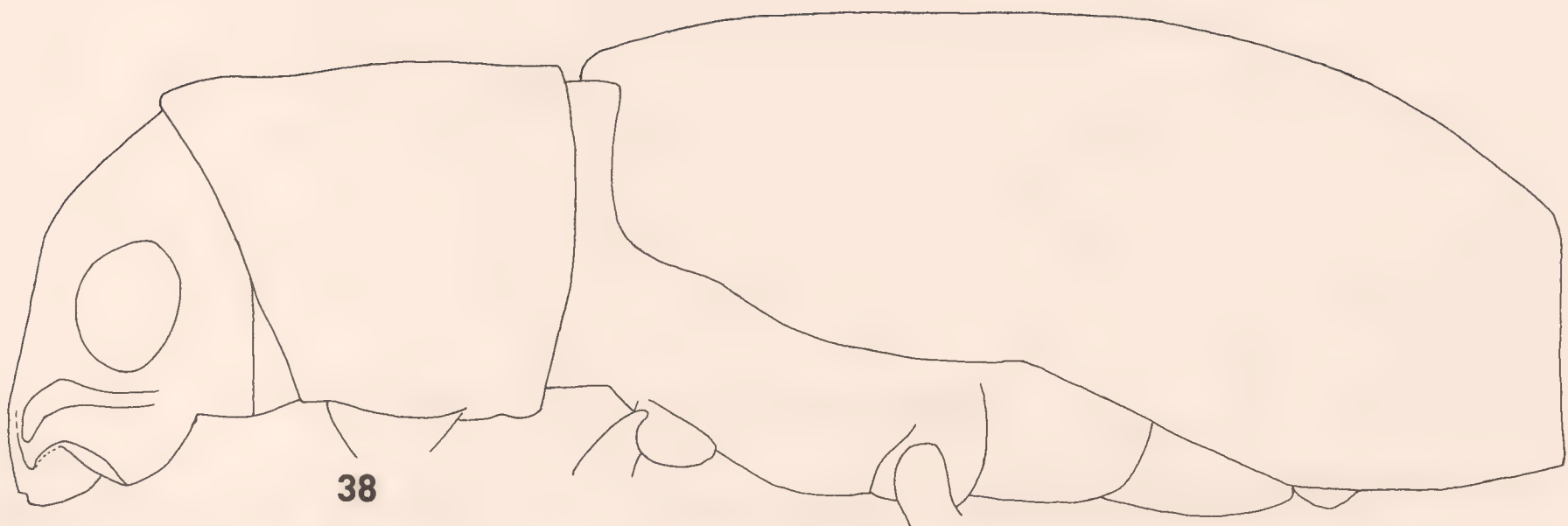
Figs. 38-41, Scalaventer species, lateral view: 38, litoreus female; 39, remotus holotype, female; 40, caymani type, female; 41, cubensis holotype, male.

Figs. 42-43, Scalaventer species, anterior view of head: 42, cubensis; 43, remotus.

Fig. 44, diagram of cross-section of abdomen through median line: a, Scalaventer cyrillae; b, Scalaventer coccolobae; c, Pandeteius nodifer.

Figs. 45, 46, diagram of vestiture of elytra of Paradacrys, a, dorsal view, b, lateral view: 45, ensiformis; 46, spatulatum.

Figs. 47, 48, diagram of elytral setae in lateral view of Scalaventer: 47, remotus; 48, litoreus.



Figures 49-60.

Figs. 49-50, foreleg of male of Scalaventer: 49, cyrillae; 50, coccolobae from Mandeville.

Figs. 51-53, Paululusus hispaniolae: 51, lateral view allotype, female; 52, lateral view of elytra of female from San José de las Matas; 53, dorsal view of holotype, male.

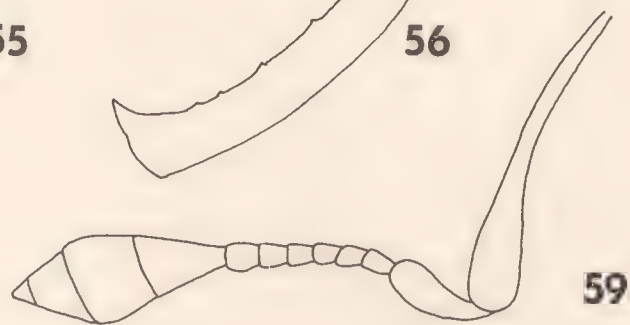
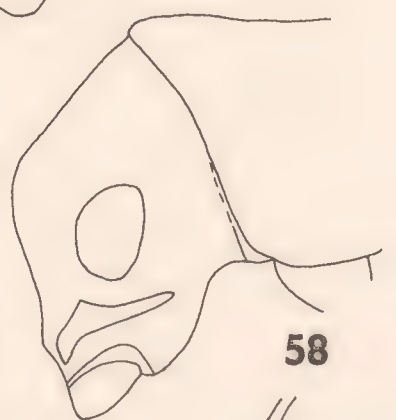
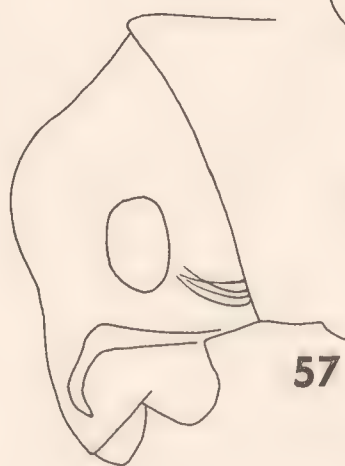
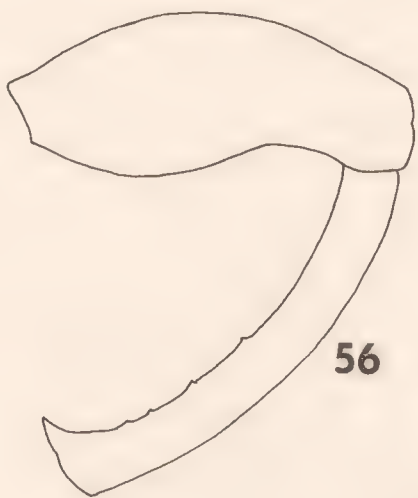
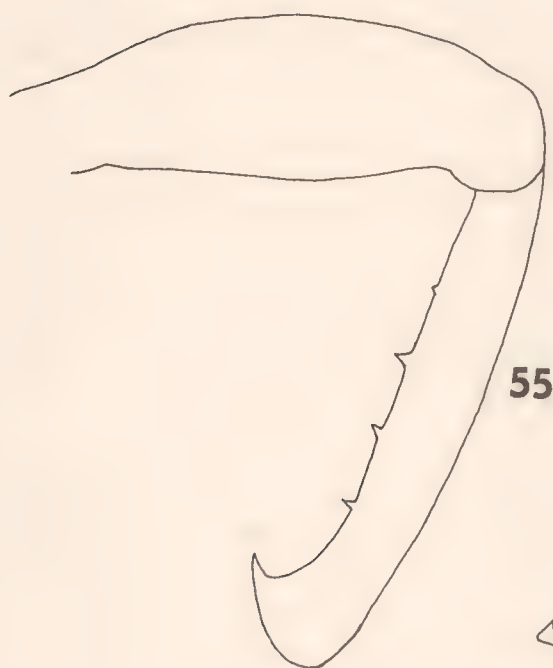
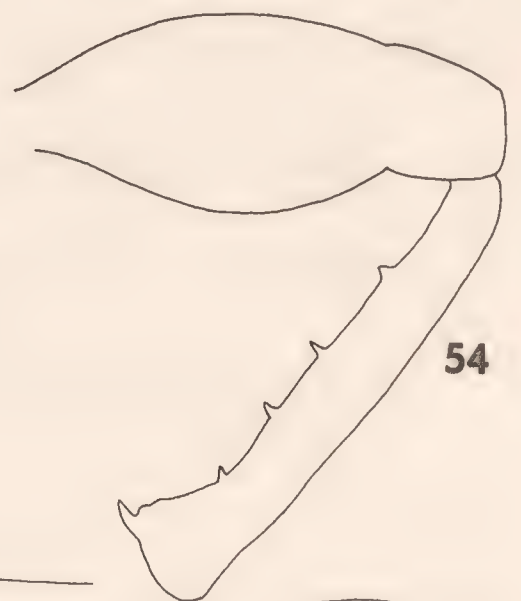
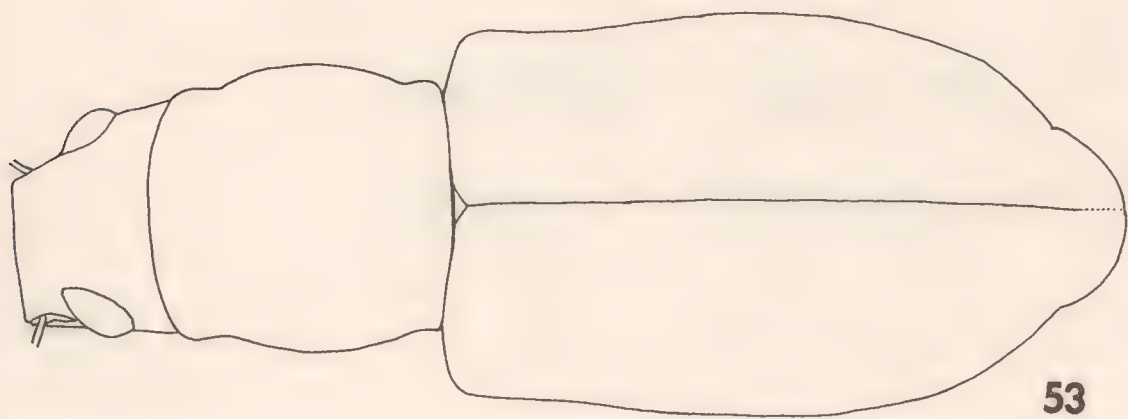
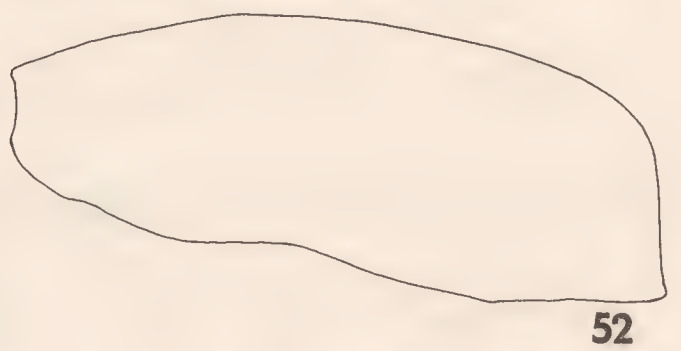
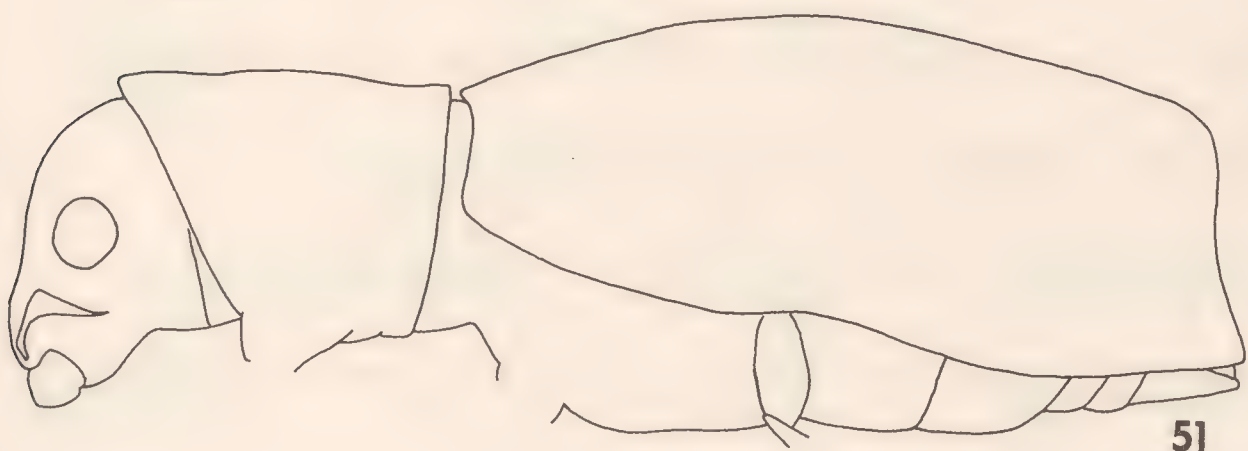
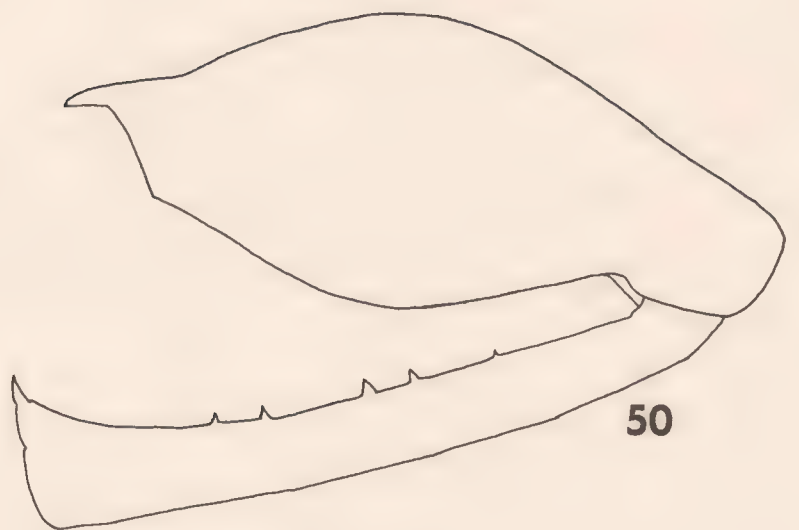
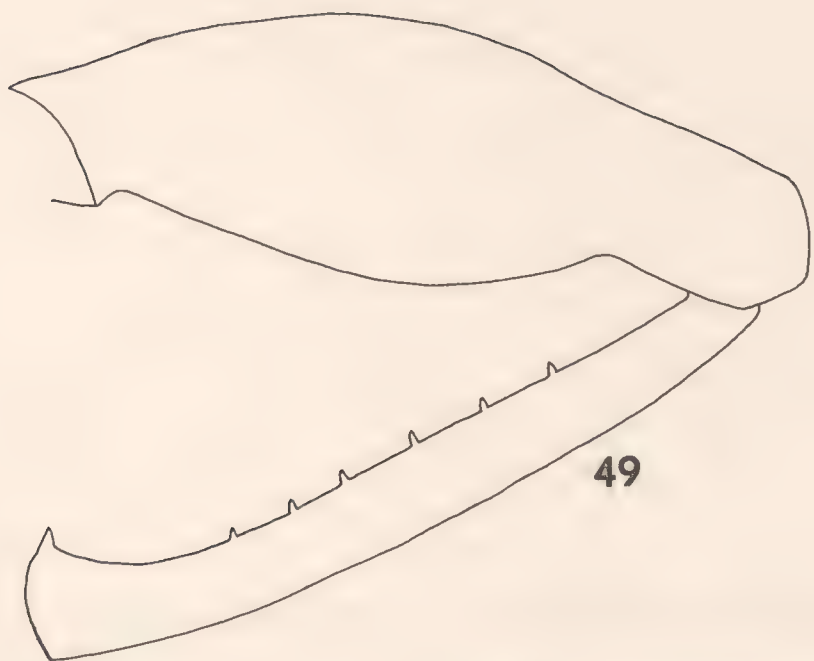
Fig. 54, foreleg of Paululusus calypso male.

Fig. 55, foreleg of Paradacrys spatulatum allotype, female.

Fig. 56, foreleg of Isodrusus guajavus male.

Figs. 57-58, lateral view of anterior portion of: 57, Pandeleteinus lucidulus; 58, Scalaventer convexifrons.

Figs. 59-60, antenna of male Scalaventer: 59, coccolobae; 60, cyrillae.



Figures 61-76. Aedeagus, lateral view and dorsal view of apex.

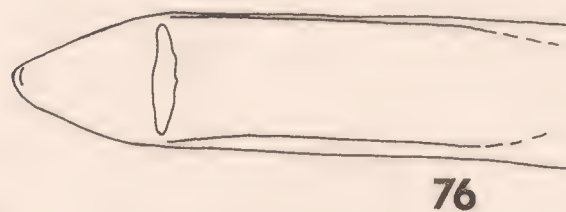
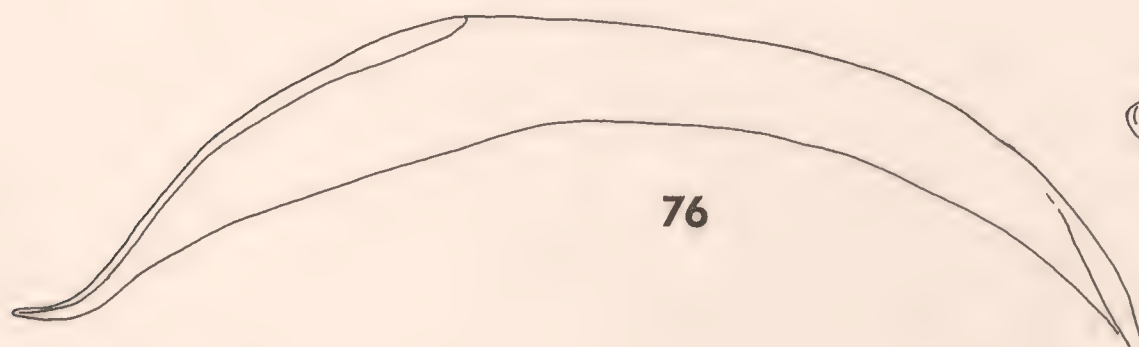
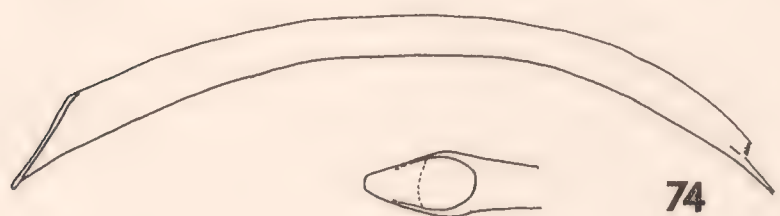
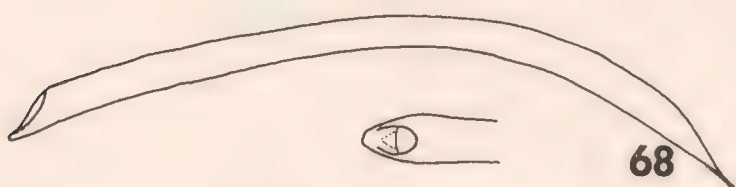
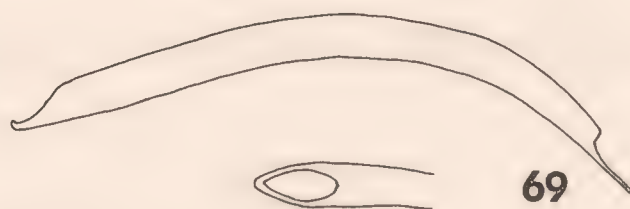
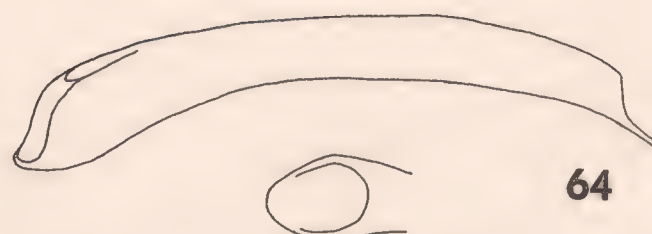
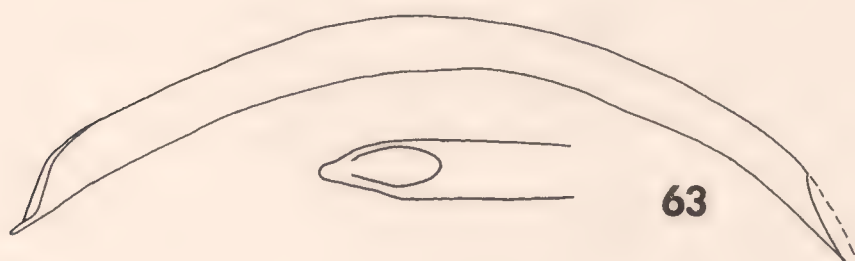
Figs. 61-67, Scalaventer: 61, cyrillae; 62, coccolobae; 63, litoreus; 64, cubensis; 65, montanus; 66, jamaicensis; 67, convexifrons.

Figs. 68, 70, 72, 74, Paululusus: 68, calypso; 70, hispaniolae from Port au Prince; 72, hispaniolae from San José de las Matas; 74, constanzae.

Fig. 69, Isodrusus guajavus.

Figs. 71, 73, Paradacrys: 71, ensiformis; 73, spatulatum.

Figs. 75, 76, Pandeteius: 75, testaceipes; 76, nodifer.



- Map 1. Distribution of Paululusus n. g. , Paradacrys n. g. and Isodacrys Sharp.
- Map 2. Distribution of Scalaventer n. g. , Pandeleteinus Champion, and Exmenetypus Voss.
- Map 3. Distribution of Isodrusus Sharp.





Map 4. Distribution of the species of Paululusus.

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